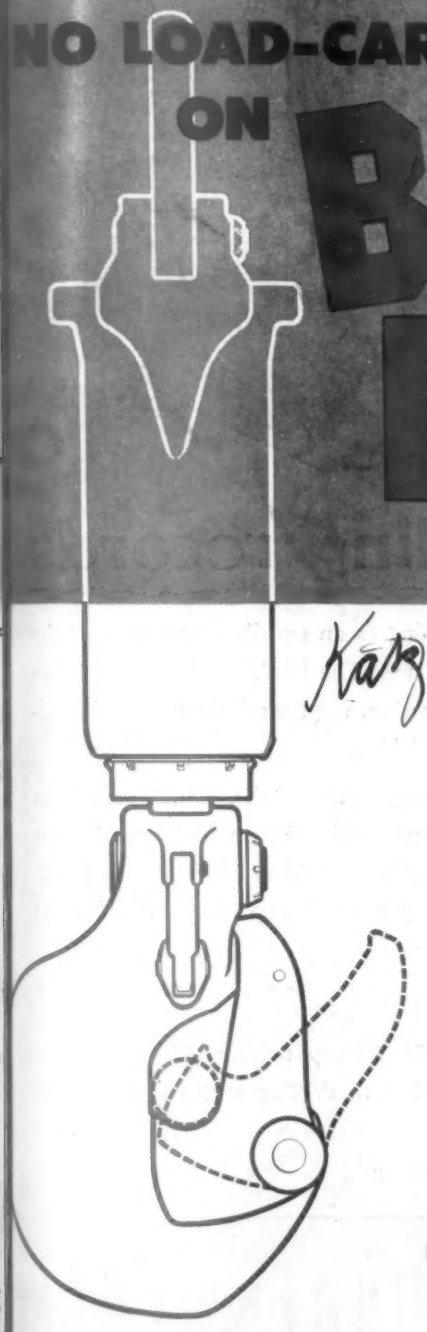
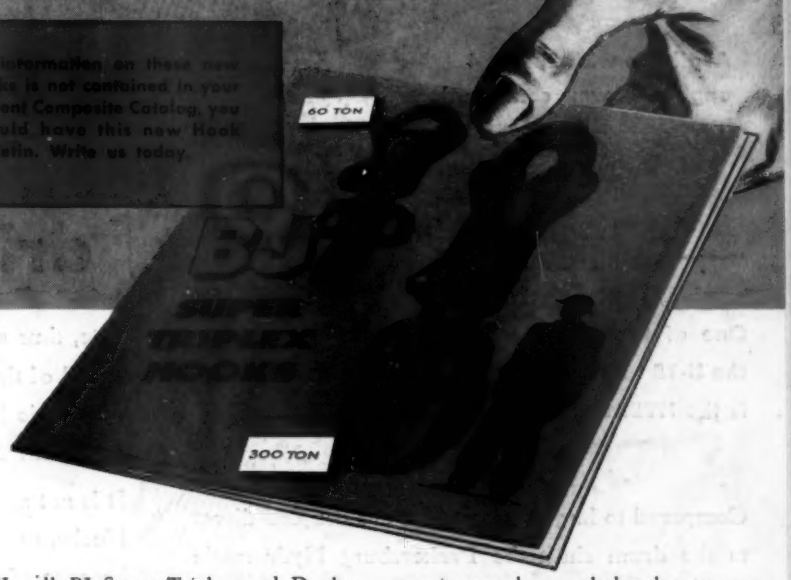
the OIL AND GAS JOURNAL

NO LOAD-CARRYING SHANK THREADS ON BJ SUPER TRIPLEX HOOKS





"In all BJ Super Triplex and Duplex Hooks only the sub-shank and sub-shank nut are threaded. The shank is a solid one-piece forging of alloy steel Sub-shank and nut are subject only to the up-thrust of the low stress relief springs. Full one hundred percent rated ball bearing support provides easy rotation under any load. Perfect alignment of all load-carrying members, including bearing surfaces, is assured by careful tooling and inspection before and after all machining operations on the housing, shank and sub-shank assemblies." For more detailed information on this and other exclusive design features of BJ Hooks write for your free copy of the new BJ Hook Bulletin today

BJ STANDS FOR ENGINEERED TOOLS

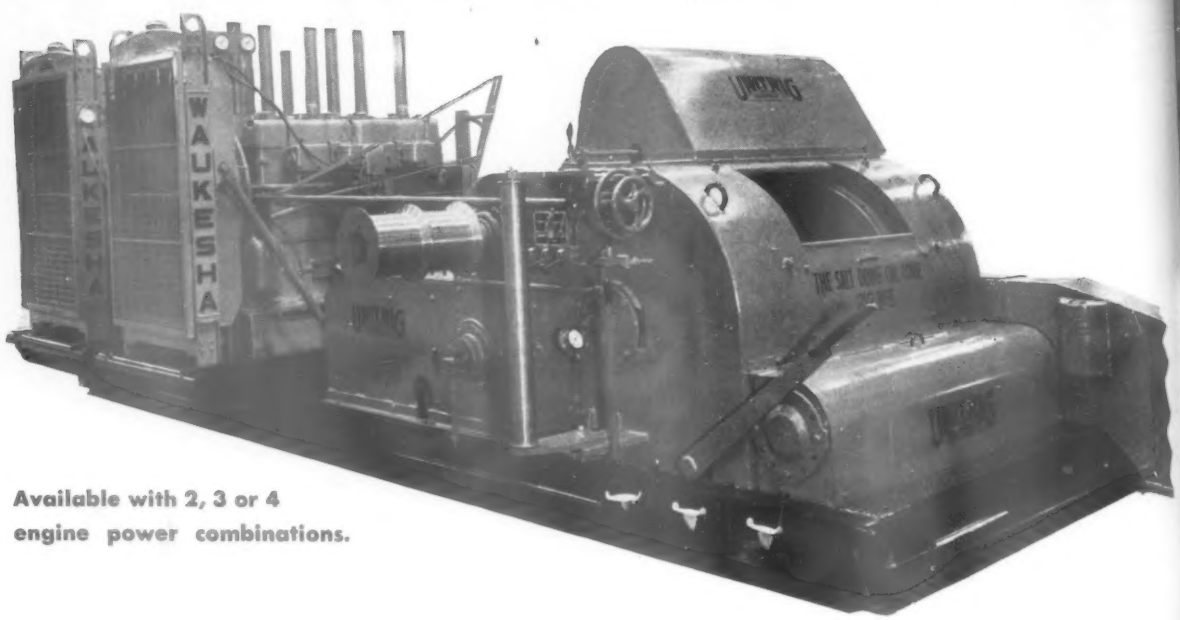
BYRON JACKSON CO.

Houston • LOS ANGELES • New York

PRICE 20 CENTS

APRIL 21, 1945

A NEW UNIT RIG



Available with 2, 3 or 4 engine power combinations.

—already making drilling records

One of the exclusive features that is enabling the U-15 to deliver such outstanding performance is the HYDROMATIC BRAKE MOUNTING.

●

Compared to larger brakes that are coupled direct to the drum shaft the Parkersburg Hydromatic Brake adds little weight to the unit. It *does not* increase the overall width of the unit, as it is mounted on top of the draw works case.

An unusual operating characteristic is the minimized resistance to the initial falling of the load. As the block speed accelerates in falling, the brake absorbs the braking energy at an increased rate, thus serving as an excellent governor of the speed of the drum. The Hydromatic Brake, being automatic in action, requires little controlling effort from the driller.

It is not necessary to de-clutch while elevating the blocks, as is customarily done with bigger brakes because of the drag. Rapidity of fall of the block is controlled by a hand regulator valve in the inlet water line.

●

The Model U-15 Rotary Drilling Rig is recommended for 7,500 ft. drilling with 4½ inch drill pipe.

Buy War Bonds — Keep Up Production

- SPITFIRE
- MOTORIG
- MOTOHOIST

} *all are equipped with* AIR-O-MATIC CLUTCHES

UNIT RIG & EQUIPMENT CO.
TULSA OKLAHOMA U.S.A.

the OIL AND GAS JOURNAL

published weekly by the

PETROLEUM PUBLISHING COMPANY

211 S. CHEYENNE AVE., TULSA 1, OKLAHOMA

Subscription rate to the petroleum industry, United States and foreign, 1 year, $6.00; 2 years, $10.00; 3 years, $12.00; 5 years, $15.00. Single copies, 20 cents. Back copies, when over a year old, 50 cents. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1945, by The Petroleum Publishing Co.

Vol. 43, No. 50 April 21, 1945

P. C. LAUINGER, President — C. O. WILLSON, Editor

S. H. ROURKE, Business Manager — H. STANLEY NORMAN, Managing Editor

R. C. MAC DOUGALL, Circulation Manager — ARCH L. FOSTER, Refining Editor

W. L. NELSON, Technical Editor — PAUL REED, Pipe-Line Editor

Associate Editors

LYNN M. NICHOLS — NEIL WILLIAMS

CHARLES J. DEEGAN — KENNETH B. BARNES

R. B. TUTTLE

District Editors

JAMES McINTYRE, Tulsa 1, 211 S. Cheyenne Ave. — THOMAS F. SMILEY, Tulsa 1, 211 S. Cheyenne Ave.

VOLBERT R. INGRAM, Denver 2, State Office Bldg. — E. H. SHORT, JR., Houston 2, Sterling Bldg.

HENRY D. RALPH, Washington 4, Natl. Press Bldg. — L. P. STOCKMAN, Los Angeles 14, Union Oil Bldg.

A. C. MacINTYRE, Oil City, Derrick Bldg. — O. C. PRESSPRICH, Baytown, News Bldg.

VICTOR LAURISTON, Chatham, Ont., 35 Stanley Ave. — FABIAN R. STALEY, New York 17, 415 Lexington

Advertising

E. KLAPPENBACH, Vice President

KENNETH J. LANGLEY, Eastern Manager, New York 17, 415 Lexington Ave. — CRAIG ESPY, Pittsburgh Manager, Pittsburgh 19, Grant Bldg.

C. R. FARMER, Chicago Manager, Chicago 2, 185 W. Madison — J. HOWARD TINKHAM, California Manager, Los Angeles 15, 1400 S. Grand Ave.

WAYNE RIVES, Gulf Coast Manager, Houston 2, Sterling Bldg. — A. J. CHAMBERS, Buckingham, East, England, 21, The Avenue

MITCHELL TUCKER, Manager, Research Dept., Tulsa 1, 211 S. Cheyenne Ave. — JOHN D. REILLY, Production Manager, Tulsa 1, 211 S. Cheyenne Ave.

Member
Audit Bureau of Circulations
Associated Business Papers

Table of Contents

NEWS DEVELOPMENTS

Ickes Temporarily Secure in Cabinet; Truman Considers Shift 88
Discussions of Oil Pact Revived 88
Replacement Costs May Be Used to Support Price Demand 89
I.P.A.A. Opposes Oil-Duty Reduction 89
Crude-Oil Purchasers Warned to Deny Subsidy 90
Texas Oil Quota Unchanged for May 90
Mississippi Drilling Activity Now at New High 92
Interests of Petroleum and Natural-Gas Industries Close 99
Madison Defendants Win Another Appeal 100
Oklahoma Now Has Highest Gasoline Tax in Nation 100

Trends 87 — Deaths 100
This Week 91 — Natural-Gas News 146
Editorial 95 — Refining News 149
International News 96 — Pipe-Line News 153

ENGINEERING AND OPERATING

Arkansas Is Proving Ground for Many New Practices 102
Field Testing of Drilling Muds 108
Modifications of Standard Methods Improve Efficiency 118
Mechanics of Production Series—No. 24—Displacement of Oil by Gravity Relative to Gas 124
Automatic Distillation Unit Shows Exceptional Efficiency 127

Progress in Metals 123 — Refiner's Notebook 141
Eng. Fundamentals 139 — Journalog 143

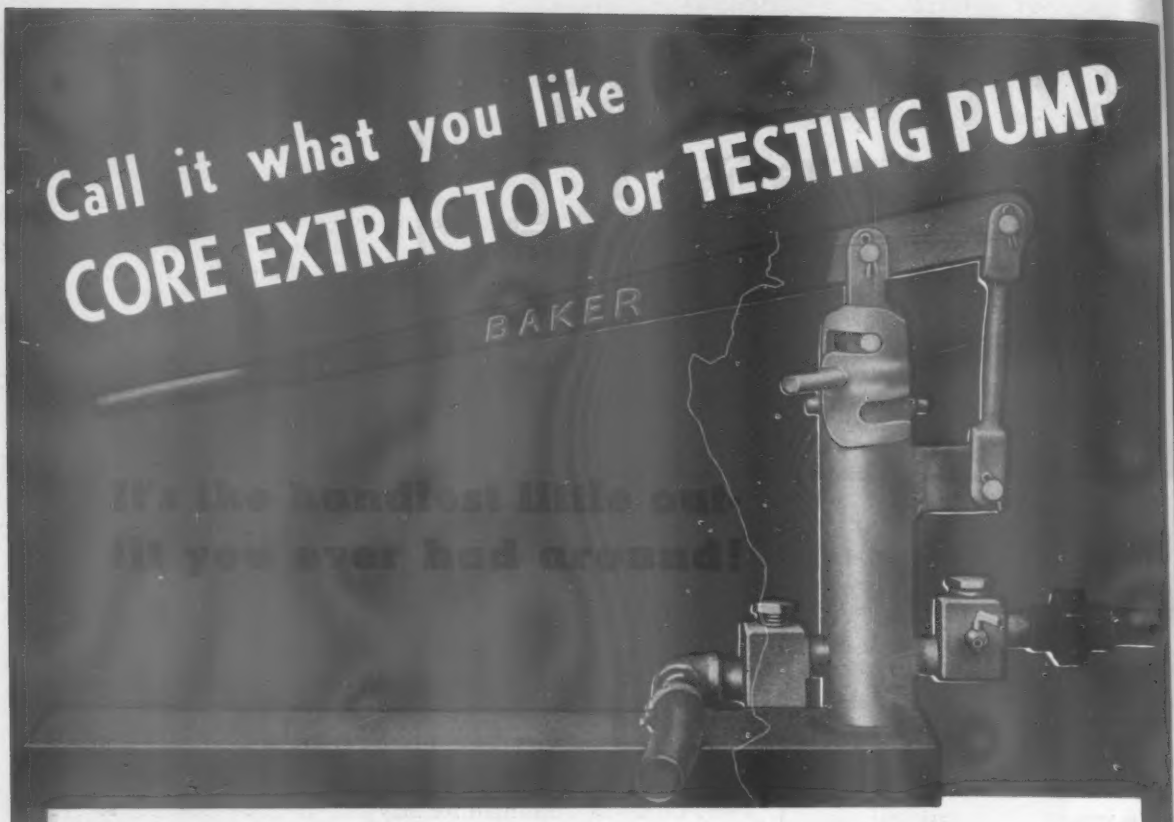
EXPLORATION AND DRILLING

Week's Highlights 157
Completions in All Fields 157
Daily Average Production for Week 159
Reports by Areas Start on Page 159
Wildcat Completions and Discoveries 164

ADDITIONAL FEATURES

Market Summary 173 — Events on the Calendar 177
Crude-Oil Prices 173 — Equipment Men in News 179
Drilling Contractors 174 — Classified Advertising 180
Personals 176 — Advertisers' Index 182

Call it what you like
CORE EXTRACTOR or TESTING PUMP



It has dozens of uses in both field and shop

The Baker Hydraulic Core Extractor and Testing Pump is a strong, simply constructed light-weight unit capable of developing pressures up to 6,000 pounds, without undue exertion.

Originally designed for removing cores from core barrels, many other oil field and shop uses have been discovered and it is today widely used as a testing pump; for removing plungers from insert liner oil well pumps; for testing valves, fittings, casing and tubing; and for setting Baker Cement Retainers when mud or cement pumps are not available.

LOW OR HIGH PRESSURE

The Baker Hydraulic Core Extractor has two pistons, one for low pressures and one for high pressures, the change being quickly made by merely moving the pressure shifter to engage the proper lugs for pressure desired.

LASTS INDEFINITELY WITHOUT REPAIRS

Simple, rugged construction insures long, trouble-free service, and by pumping clear water (or water containing soluble oil) through the unit after use, the essential working parts always function properly and seldom require replacement.

The Baker Hydraulic Core Extractor and Testing Pump is identified as Product No. 540, and is described in detail on Page 374 of the 1944 Baker (or Composite) Catalog.

BAKER OIL TOOLS, INC.

Houston—LOS ANGELES—New York

the OIL AND GAS JOURNAL

Trends

Crude-Oil Production
By States—Page 159

CRUDE-OIL STOCKS 220,871,000 bbl. as of April 7—down 2,911,000 bbl. One year ago 234,172,000 bbl.

GASOLINE STOCKS 98,712,000 bbl. as of April 7—down 300,000 bbl. One year ago 87,247,000 bbl.

RESIDUAL FUEL-OIL STOCKS 41,745,000 bbl. as of April 7—down 1,582,000 bbl. One year ago 52,193,000 bbl.

GAS OIL AND DISTILLATE STOCKS 26,889,000 bbl. as of April 7—up 107,000 bbl. One year ago 29,926,000 bbl.

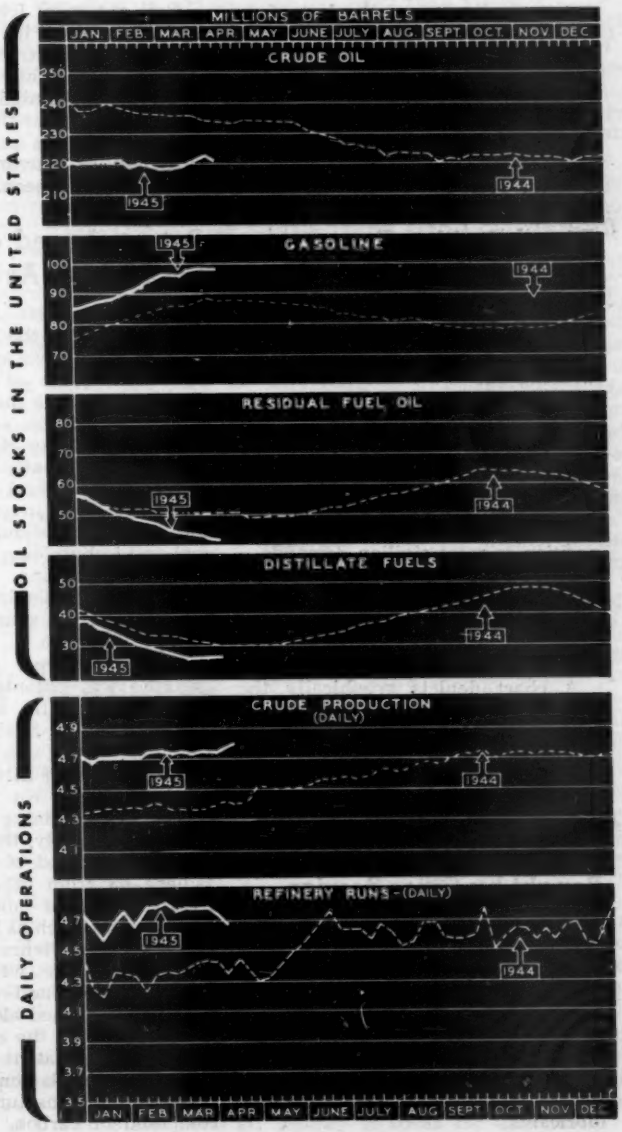
CRUDE OIL PRODUCTION 4,801,800 bbl. as of April 14—up 19,700 bbl. One year ago 4,437,620 bbl.

REFINERY RUNS 4,677,000 bbl. daily week ended April 7—down 65,000 bbl. One year ago 4,459,000 bbl.

ANNUAL statements of the larger oil companies available over the past few weeks have been of special interest in revealing the scope of petroleum's wartime operations. With few exceptions, the 450 refineries in the United States have been contributing at least one war product, with cases cited in which, including chemicals, single refining organizations have been making more than 50.

ECONOMISTS within and outside the petroleum industry are endeavoring to analyze these operations in their relation to postwar activities. The conclusion of some observers is that the octane number of all grades of civilian gasolines will be increased from their prewar ratings. It has been pointed out that the automobiles then in service will not require these higher-octane fuels, but this fact, it is contended, will not be controlling in what is done. Manufacturing data indicate that the octane rating of over-all gasoline output of some postwar plants, before the use of minimum quantities of tetraethyl lead, will be greater than that of the regular grades of prewar motor fuels. The same analyses also show that the increased output of light hydrocarbons from natural gasoline, cycling plants and refineries will mean that postwar motor fuels can be made more volatile. The conclusion is that with restoration of normal competitive conditions in marketing, those in a position to do so will immediately start stressing the superior qualities of their gasolines.

OBSERVERS are agreed that refiners will be able to retain part of their markets for war products after peace. The most important of these will be synthetic rubber. Regarding rubber the annual statement of Humble Oil & Refining Co., the oil industry's largest manufacturer of war products, this week explained: "Butyl rubber is proving extremely satisfactory in the manufacture of inner tubes. The superiority of butyl for this use is such that inner tubes may continue to be made from it even after ample supplies of natural rubber are again available. It is generally believed that the Government will continue to operate a substantial part of its synthetic-rubber facilities for 2 or 3 years in order to meet accumulated demands, even after natural-rubber supplies become available. The future of the synthetic rubber industry thereafter depends upon national policy and economic considerations."



Ickes Temporarily Secure in Cabinet; Truman Considers Shift

WASHINGTON.—President Harry S. Truman is unlikely to decide for some time whether Harold L. Ickes, secretary of interior and petroleum administrator for war, should continue in his cabinet post.

That changes in the cabinet, possibly reaching most of the places, will come in time is generally accepted in Washington. Friends of Truman report that some resignations are certain to be accepted.

The president, however, is confronted with so many important questions to decide that the shift will probably be gradual. Ickes' future may be one of the last of the cabinet problems to be decided by Truman.

It is certain, however, that democratic party organization leaders will urge upon the president that he accept Ickes' resignation. They have long been dissatisfied with the interior secretary's attitude toward the party itself, and his failure to participate in the campaigns, both through speeches and contributions. The whole Interior Department, including all top officials, contributed less than $700 to last year's campaign.

That this recommendation will be carefully considered by Truman in making his decision is definite. The new president is not only a strong believer in close party organization, but one of his closest friends and advisors is Robert Hannegan, chairman of the National Democratic Committee, and also a Missourian.

Best argument Ickes will have on his side will be his position as petroleum administrator. Truman has made it clear that he intends to do nothing which might interfere with the prosecution of the war. Whether he considers this part of Ickes' job sufficient to warrant his retention remains to be seen.

Diesel Position Secure In Postwar Power Field

A large postwar demand for diesel engines is building up, because of two conditions: First, engines are wearing out at a faster-than-normal rate in mills, factories, power plants, ships and mines, due to overtime work necessitated by the war effort. Second, since practically all diesel engine builders have been 100 per cent in war work since the war started, they have not been in position to meet civilian demands.

These and many other facts about the industry are pointed out in "The Story of the Diesel", a booklet just published by the Diesel Engine Manufacturers Association.

A chart depicts graphically the industry's growth in horsepower-output from 1937 to 1944. In 1937 a production of barely 2,000,000 hp. was recorded. This had leaped to 35,000,000 for last year.

Bradford Field Properties Bought by Cities Service

BRADFORD, Pa.—Cities Service Oil Co. (Pennsylvania) has purchased three properties in the Bradford field from Robert H. George for approximately $1,000,000. Further development by water flooding is planned. The purchase is in conformity with the company's program for manufacture of Pennsylvania lubricants.

Patents Issued on Methods For Making Aviation Fuels

WASHINGTON.—Among patents announced by the United States Patent Office two are on processes for manufacture of aviation fuels. Another is on a new method for solvent separation of butadiene.

Louis A. Clarke of Fishkill, N. Y., was granted a patent, No. 2,373,101, on an aviation fuel described as a "superfuel." His invention relates to the utilization of mixtures of normal and isobutylenes for the alkylation of isobutane. The resulting alkylates are blended to form the final fuel. The patent was assigned to The Texas Co.

A high-powered, stable aviation gasoline was patented by John E. Mital of Alton, Ill., as No. 2,373,631 and assigned to Shell Development Co.

David Craig of Silver Lake, Ohio, received patent No. 2,373,170 on a process for obtaining purified butadiene. Specifically, the invention relates to a method of separating butadiene-1,3 from other four-carbon hydrocarbons of about the same boiling point, such as butane and the butenes or butylenes.

The butadiene which goes into synthetic tires and other familiar products is formed along with other hydrocarbons in the cracking of petroleum. This patent covers a new class of materials consisting of normally liquid unsaturated alcohols, composed of carbon, hydrogen and oxygen, such as allyl alcohol or 2-propen-1-ol or 3-buten-1-ol. It is held that these alcohols will operate on butadiene as highly selective solvents providing a yield of 95 per cent butadiene from a starting material containing 51 per cent butadiene and 49 per cent butylenes or butane. The patent was assigned to B. F. Goodrich Co.

Discussions of Oil Pact Revived

WASHINGTON.—A meeting of the National Oil Policy Committee of the Petroleum Industry War Council was held here April 18 and 19 for further consideration of the Anglo-American oil pact. Recommendations of the Departments of State and Justice and Petroleum Administration for War were presented by Deputy Administrator Ralph K. Davies.

As in previous conferences, one of the major points discussed was the industry's request that the treaty carry some provision granting immunity from antitrust action as a result of cooperation by the industry with the International Petroleum Commission.

Industry members were hopeful that compromise language, providing clearance with the Department of Justice, could be worked out. There was no indication, however, that the department had modified its stand, understood to be that neither precedent nor actual need for such a provision exists.

Synthetic Rubber Finding New and Permanent Uses

NEW YORK.—Areas of demand, once unsuspected, are gaining for synthetic rubber new and permanent places in home and industrial life, according to P. W. Litchfield, chairman of Goodyear Tire & Rubber Co. "For many types of goods synthetic has proved superior to natural rubber," he declared. "Its exceptional resistance to certain solvents makes it more desirable in the manufacture of rubber products exposed to the action of such liquids as gasoline, oils and acids."

After 1950, Litchfield predicted, probably more than 100,000 long tons of natural and synthetic rubber will go annually into such products as mattresses, spring suspensions, vibration dampeners, shock absorbers, etc. These fields were just bebinning to be explored when war struck. Litchfield mentioned rubber automobile springs as part of a future world in which rubber will yield greater efficiency and comfort.

Replacement Costs May Be Used To Support Higher-Price Demand

by Henry D. Ralph

WASHINGTON. — Figures on replacement costs to be gathered in an Office of Price Administration cost study may be used by the industry to support its demand for a price increase, but will not be considered by OPA in evaluating the industry's net position. The survey went to a selected list of 700 producers this week.

The replacement-cost factor, long a bone of contention between industry and OPA, was included in the questionnaire at the request of the National Crude Oil Industry Advisory Committee. Information on this factor will be turned over to the committee by OPA.

"We believe our position is sound and fair," Orville Judd, associate director of the OPA fuel price division, said this week.

"There is no doubt that the cost of finding oil has increased but unless the increase has changed the net position of the industry we expect it to be absorbed as similar cost increases have been absorbed in other industries."

Committee Emphasizes Stand

In a letter to the producers receiving the questionnaire, James V. Brown, secretary of the industry committee, again emphasized the committee's position that replacement costs must be taken into consideration and that the law permits it. If OPA continues its present stand, Brown said, the committee will have the facts for use in support of a request for reconsideration or an appeal.

Judd explained the inclusion of the replacement factor in a letter accompanying the questionnaire.

"It is the position of this office that it is necessary to obtain data on earnings, both currently and for prewar years. It is the position of the National Crude Oil Industry Advisory Committee that the cost of replacing oil reserves should be fully considered. The industry committee wishes, therefore, to obtain information which will show expenditures made for finding and developing oil reserves."

OPA hopes to have the questionnaires back by May 1.

Meanwhile, a subcommittee of the National Refiners Industry Advisory Committee is preparing a report for submission to the committee and later to OPA. The committee's recommendations were asked preparatory to conducting a cost study to determine the ability of the refiners to absorb any increases which may be granted to producers.

The refiners' advisory group has been asked for advice not only in drafting a report form for the cost study but for recommendations on the whole problem of cost absorption at the refinery level. OPA hopes to be able to start collecting information in the cost study among refiners early in May, and to have the survey completed within a few weeks after the crude-oil survey is finished.

I.P.A.A. Opposes Oil-Duty Reduction

WASHINGTON. — Opposition of the Independent Petroleum Association of America to further reductions in tariffs on petroleum imports was presented here this week before the House Ways and Means committee.

The committee opened hearings April 18 on the administration's bill to extend reciprocal trade agreements and provide for a 50 per cent reduction in import duties.

Since the early part of 1941, when the United States - Mexico trade agreement became effective, import duty on all crude, fuel oil, asphalt and road oils has been 10.5 cents per barrel, irrespective of volume or point of origin, excepting unfriendly countries. Previously, the United States-Venezuela trade agreement, executed December 16, 1939, provided for an import duty of 10.5 cents per barrel on heavy products and crude oil up to a limit of 5 per cent of the domestic refinery throughput for the preceding year. Under the Venezuela treaty, the State Department assigned quotas to the Latin American shipping countries based on their exports in the last pre-treaty year.

The Mexican trade agreement abolished quotas and ceilings on the volume of petroleum which could be discharged at United States ports at the reduced tariff rate and this treaty prevails.

The 3-year primary term of the Mexican trade agreement expired early in 1944 but the treaty provided that it would continue indefinitely but could be abrogated by either party 6 months after serving notice.

Another Reduction Proposed

Legislation now under House consideration would make another reduction in the oil-import duty of 50 per cent. Crude oil and heavy products, the new bill provides, could be imported into the United States upon duty payment of 5.25 cents per barrel.

Before the Venezuelan and Mexican trade agreements were negotiated the import duty on crude and heavy products was established at 21 cents per barrel. Gasoline, naphtha and other light products carried a duty of 1 cent per gallon, or 42 cents per barrel.

Revisions considered by the House Ways and Means committee this week would reduce the import duty on motor fuel and similar light products to 10.5 cents per barrel.

Operators Urge Hard Fight Against Federal Control

AUSTIN.—A vigorous fight by states of the Southwest against federal control of oil and gas production was urged by a committee of producers at a meeting here last week called by Olin Culberson, chairman of the Texas Railroad Commission. The committee was appointed by Gov. Coke R. Stevenson. Current investigations by Federal Power Commission into natural-gas waste are a step toward federal control of both oil and gas, Culberson declared.

George A. Hill, Jr., president of Houston Oil Co. of Texas, and E. Buddrus, of Oklahoma City, president of Independent Natural Gas Association of America, urged the committee to promote concerted effort by southwestern states to retain control of these resources.

Hill suggested that Governor Stevenson call a meeting of governors of other southwestern states, Buddrus said it would be "suicide" for the individual states to carry on the fight except as a unit.

All speakers were in agreement they wanted control of gas and oil retained by the states, but the necessary program for a fight had not been worked out.

Clint Small of Austin, representing Chicago Corp. and Tennessee Gas & Transmission Co., said the legislature of Texas was the proper agency to speak for this state.

Crude-Oil Purchasers Warned to Deny Subsidy to Uncertified Wells

WASHINGTON. — Crude - oil purchasers were warned this week by the Office of Price Administration to pay no premiums on production from new wells or on oil commingled with production from new wells without a producer's statement to the effect that the wells concerned have been reported to OPA.

No new pool discovered on or after January 1, 1944, is entitled to a premium price increase unless it has been declared eligible and a specific increase has been designated, OPA said in a letter to purchasers. When premiums are paid on unreported wells completed, deepened or plugged back after that date, Defense Supplies Corp. is frequently unable to reimburse them, and purchasers must deduct the amount of overpayment from subsequent payments to producers.

Purchasers were asked by OPA to advise all producers that they will not pay premiums on new wells without notification that new production has been reported to OPA.

This report (OPA Form 652-2170) should be filed within a week or 10 days of the date of completing a new well, OPA said. Copies of the form may be obtained from purchasers or from the Defense Supplies Corp., Washington 25, D. C.

The statement is not required for wells drilled in New York, Pennsylvania, or West Virginia, nor in certain previously announced areas in Kansas, Ohio, and Oklahoma, OPA said.

Texas Oil Quota Unchanged for May

WASHINGTON. — Crude - oil production certification for Texas during May will continue at the April rate, the Petroleum Administration for War announced this week.

Total production of petroleum liquids including but not limited to crude oil, condensate and natural gasoline will be 2,332,000 bbl. daily, of which 2,170,300 bbl. will be crude oil.

The total crude-oil production from fields in railroad commission Districts 7C and 8 required to meet the May certification is 438,000 bbl. daily, the same quantity as in April.

The 16,000 bbl. daily increase in sweet crude certified for allocation to the East Texas field in February, March and April, will be continued into May, PAW said. Limitations of transportation and refining facilities do not permit further shifting of additional movements of sweet crudes from other areas into the Longview terminal of the War Emergency Pipeline.

Irizarry Speaks Before Tulsa Nomad Chapter

Dr. Oscar B. Irizarry, editor of Petroleo Interamericano, Latin-American affiliate of The Oil and Gas Journal, was the principal speaker at a monthly luncheon of Tulsa Nomads last week. The luncheon was held in observance of Pan American Day and several students and engineers from Latin-American countries were club guests.

Dr. Irizarry discussed the recent Chapultepec conference in Mexico. He said that the conference marked another major step in the establishment of satisfactory political and trade relations among the countries of the Western Hemisphere based on the "good neighbor" policy of the United States from which the oil industry of the two continents would benefit. Guests of the club included: Julio Medina, Arturo Hidalgo, Ramon Dorta, Hernando Latorre, Julio Sosa, Manual Iribarren, Daniel Vargas, Luis E. Corrales, and Luis Bueno.

DR. OSCAR B. IRIZARRY

Snodgrass Promoted in PAW Foreign Division

WASHINGTON.—C. Stribling Snodgrass, director of the Petroleum Administration for War's Division of Foreign Refining, has been appointed chairman of the PAW foreign operating committee and, also, vice chairman of the foreign petroleum committee.

While he retains his position as division director, Snodgrass succeeds W. D. Crampton, who recently resigned, to the committee positions.

The foreign operating committee is made up of the directors of PAW's three foreign operating divisions: refining, supply and distribution, and production.

Panhandle P. & R. to Buy Engineering Concern

Panhandle Producing & Refining Co.'s annual report to stockholders reveals that it has completed negotiations for a controlling interest in James Stewart & Co., building and engineering concern. Panhandle is paying $2,000,000 for its interest. Extensive drilling operations in Texas oil fields have been started by Stewart, the report says. It completed four producers, all wildcats, in 1944. Panhandle completed, by itself or jointly with others, 16 producers. In acquiring control of Stewart, Panhandle plans to purchase 50.7 per cent of the outstanding common shares.

Stewart will be operated as heretofore. Key personnel will remain under the direction of Harry D. Watts, Stewart's president. The purchase will enlarge and diversify Panhandle's stake in the construction and engineering fields. Panhandle and its affiliates, with a 30 per cent interest, are the principal stockholders of Warren Brothers Co. Stewart's war record includes the construction of $200,000,000 of war-plant facilities.

Ihrig to Discuss Working of Hydraulic Power System

H. K. Ihrig, Oklahoma City, manager of the technical service department of Kobe, Inc., will address a meeting of American Society of Mechanical Engineers April 26 at the Mayo Hotel, Tulsa, on paraffin control and oil-well pumping by means of a hydraulic power system. A transparent working model of the subsurface pump will be used in explaining the mechanics of the system. All valves and working parts will be seen in operation.

This Week

DRILLING—Week's completions totaling 529 set new peak for year. . . . Previous record of 522 set during week ended March 3. . . . If pace is held, industry will finish more than 6,500 wells in second quarter. . . . PAW goal of 6,800 wells could be realized if current rate of increase is maintained. . . . Equipment prospects brightened. . . . Real trouble will be in translating reduced war requirements into industrial products—in time. . . .

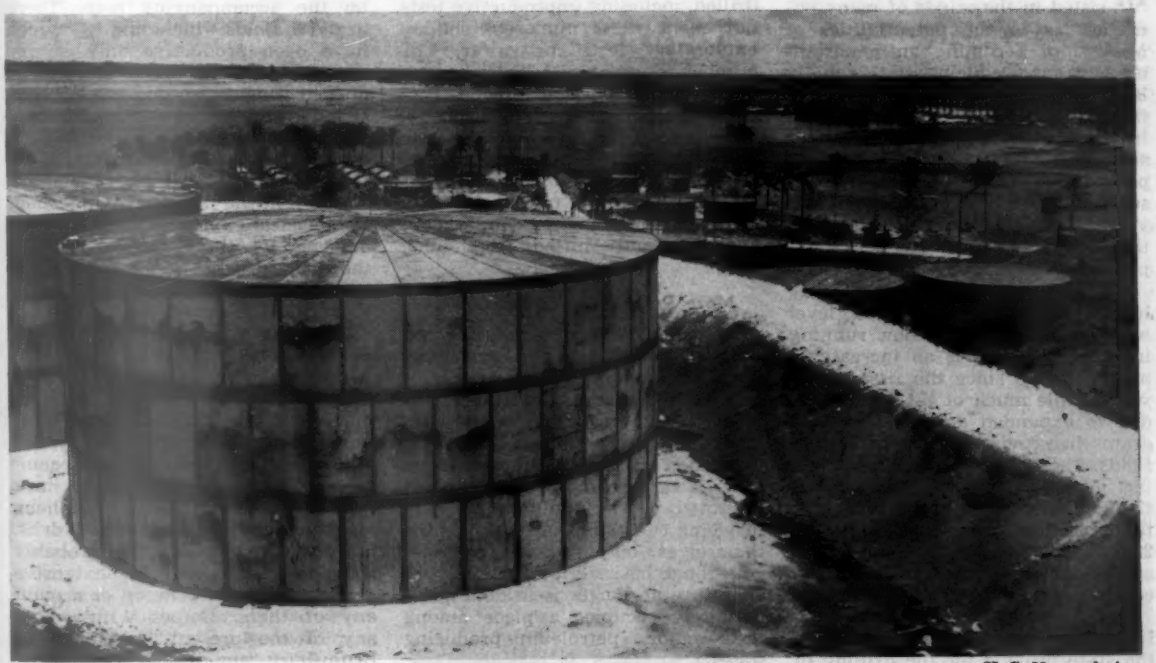
PRODUCTION—Another record set with national crude-oil output of 4,801,000 bbl. daily. . . . Kansas, Michigan, Mississippi and Oklahoma chief contributing states. . . . ¶Texas' quota of 2,330,000 bbl. daily for all petroleum liquids continued through May. . . . ¶National production assignment expected to be unchanged next month. . . .

INTERNATIONAL—Aviation gasoline unit, costing $6,700,000 approved for Curacao. . . . American manufacturers to furnish about $1,650,000 of required equipment—for cash. . . . ¶Anglo-American petroleum agreement discussions resumed this week. . . . Final decision likely to await close of San Francisco peace conference. . . . ¶Accelerated drilling programs in South America reflected in current crop of annual statements. . . . Plans of individual companies confirm government programs of higher production, intensified exploratory activity. . . . Details taking shape for assigning more materials to Argentina. . . .

GOVERNMENT—Petroleum Administrator Ickes temporarily secure in President Truman's cabinet. . . . Disgruntled political leaders said to be sharpshooting for Ickes. . . . His position in vital petroleum industry may influence Truman to leave this vital war commodity undisturbed. . . . Friction between the oil administrator and the new president has been largely subordinated, held in check—but those "in the know" say it can't last indefinitely. . . . President's determination to finish the war successfully and expeditiously may outweigh political pressure to oust Ickes. . . .

MATERIALS—WPB's top allocation committee meeting soon to assign critical materials for third quarter. . . . Until then, industry won't know definitely where it stands in drilling and construction program. . . . Lag in translating allocation of raw materials to usable equipment works against prompt relief. . . . Drill pipe and other tubular goods remain most threatening deterrents to fulfilling program. . . .

NATURAL GAS—Texas Legislature rejects new regulatory measure dealing with gas production. . . . Railroad Commission is not using existing powers to prevent physical waste, some assert. . . . Gov. Coke Stevenson's special committee sees gas problem as national in scope, advocates establishment of nation-wide policy. . . . Move intended to cement inseparable characteristics of crude petroleum and natural gas. . . . ¶Federal Power Commission investigation may be blocked, if Congress sees wisdom of listening to Petroleum Industry War Council's national oil policy committee. . . . ¶Mississippi's gas conservation hearing May 1 may produce fireworks. . . . At least one large operator unsympathetic to state assuming regulatory authority. . . .



U. S. Navy photo

Typical Pacific military fuel base, symbolic of those which the industry must fill to the brim for the concentrated attack on Japan

Left: One of the many heavy-duty steam rigs now operating in one of Mississippi's new deep producing fields. Right: Typical pumping well in one of Mississippi's low-pressure, heavy oil fields

Mississippi Drilling Activity at New High With 80 Rigs Now Running in State

by Nell Williams

MUCH of the doubt that has persisted in the minds of many operators as to the potentialities of Mississippi becoming an important oil and gas-producing state rapidly is being dispelled. The number of fields is increasing constantly. The list of known salt domes and other structures offering reasonable prospects for discovery of additional reserves is steadily swelling. These developments give incentive for further intensification of the active exploration.

Drilling activity this year already has climbed to new record level with a total of 80 rigs now running in the state. This is an increase of more than 25 since the first of the year. While much of the increase is due to expanded development programs in proving up newly opened fields, there has been no slackening in wildcatting. Of the 80 active operations, 30 are in areas so far unproductive and scattered over 22 counties, mostly, however, in a section extending across the south central part of the state.

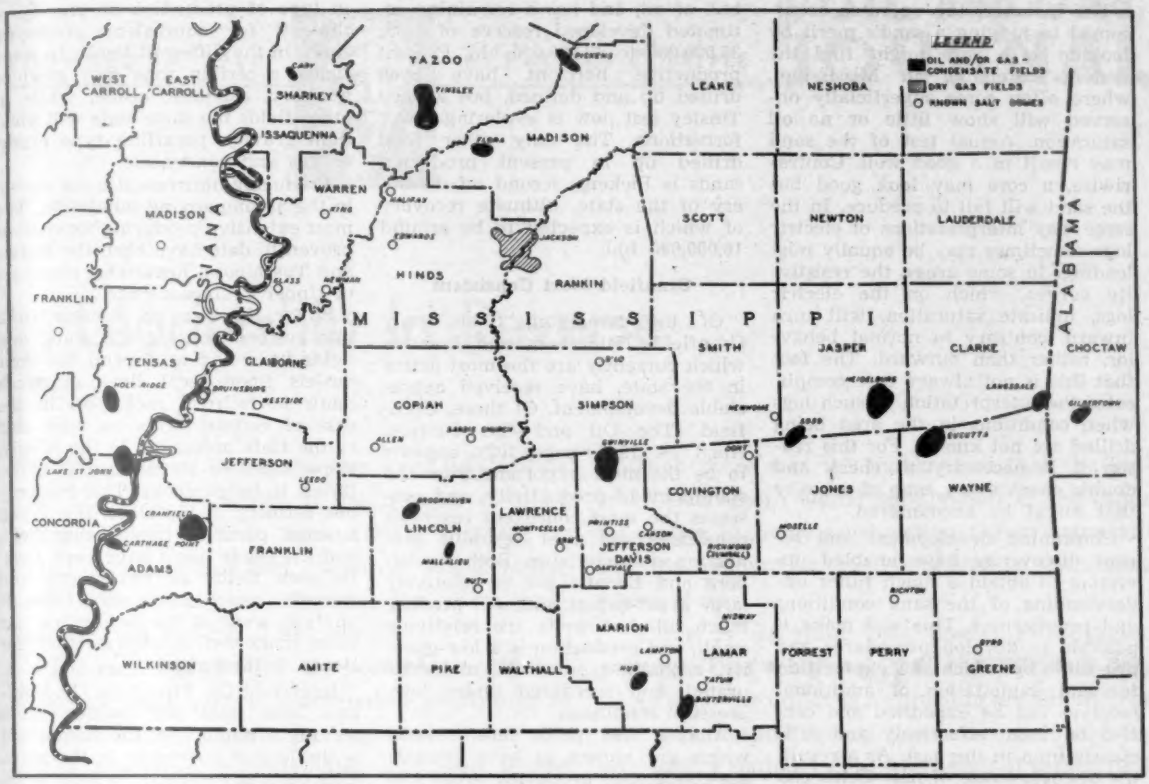
Appropriations and plans of nearly all companies now operating in the state provide for the drilling of a greatly increased number of wells during remainder of the year. In 1944, more than 200 wells were drilled, including unproductive tests, but exclusive of numerous shallow exploratory tests for sulfur. This number is expected to be increased at least 50 per cent during 1945. Already this year more than 85 wells have been completed, including 45 producers. Additional drilling rigs to augment those already operating are being moved into the state as rapidly as they can be made available and shifted from other areas.

More Permanent Organizations

Particularly significant is the setting up by both major and independent companies of an increasing number of enlarged and more permanent operating organizations within the state. The influx of operators and drilling contractors from other areas is continuing at an accelerated pace. Supply houses and servicing companies are entrenching themselves on an extensive and long-range basis. Truly, Mississippi's oil future no longer is in doubt, but definitely occupies a place among the major petroleum-producing states.

Fields discovered so far in Mississippi are listed in an accompanying tabulation and their locations shown on the accompanying map. There are 18 fields, including 3 which have been productive only of dry gas. Of the total, three have been opened this year. In addition, 26 shallow and medium-depth, piercement-type salt domes, each of which represents a definite potential oil field, have been proved. These are shown on the accompanying map. Geophysical exploration, which gave evidence of these domes prior to the drill, also has indicated the existence of a large number of additional domes as yet undrilled.

Although most all the existing fields are believed to be associated with salt domes, only one of the known domes has been proved productive so far. This is the Bruinsburg dome, Claiborne County, on which one gas well has been completed. Showings of oil and gas have been encountered on some of them, however, and with continued drilling commercial production probably will be established. No extensive drilling has been done on or around any of them. Domes with which any of the present fields, except Bruinsburg, might be associated probably are deeply seated and on them no tests have been drilled to



Sectional map of Mississippi taking in strip across central part of state showing proved fields except Amory (located in northeastern part of state) and all known salt domes

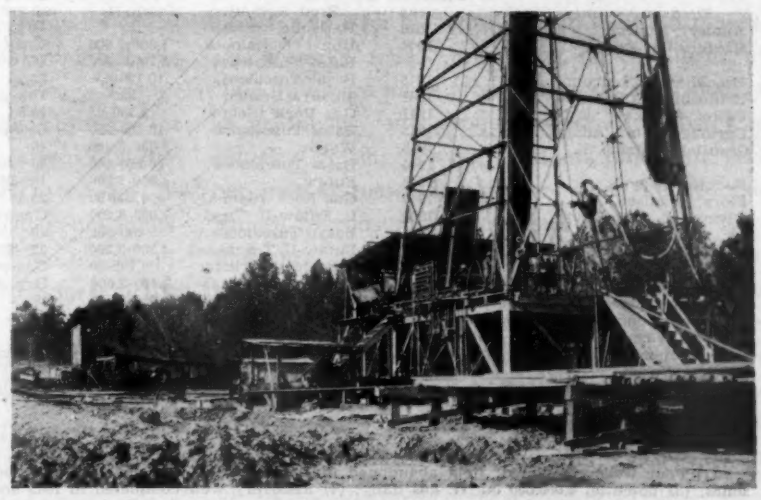
the cap rock or salt.

As shown by the map all the existing fields and known salt domes, with the exception of the Amory gas field, are located in a belt extending across the central and southern part of the state, roughly outlining and taking in what is referred to as the Mississippi embayment. The Amory field in which there has been no production nor development since 1937, is in the northeastern part of the state and is not on the map.

Except for the Amory and Jackson gas fields, the latter also now nearing depletion, and two of the salt domes (Midway and Edwards, found in 1937 and 1938, respectively), all have been discovered since 1939. Thirteen of the 18 fields and 16 of the 26 domes have been found within the past 2 years.

Various factors have combined to retard development and create the many uncertainties as to Mississippi's oil importance. Structural and formational conditions in many instances are unlike anything previously encountered in other areas. With few exceptions the fields which have received appreciable development have been found to have highly complex fault patterns. Producing horizons generally contain a multiplicity of sands, frequently broken, due to shaling, into numerous thin, irregular stringers or lenses. Failure to comprehend such extreme conditions has resulted in numerous disappointments and led many operators astray in their evaluations and interpretations of areas.

Evaluations of producing zones and sands have been further complicated by certain irregularities in behavior of saturated and nonsaturated zones to known methods of exploration. No one means of identifying and logging saturation points can be relied upon entirely. All known procedure usually must be used and their findings correlated for best results. In exploratory tests instrument determinations usually must be verified by drill-stem tests of individual zones and lenses. This makes determination of most effective zones of production slow and tedious and adds substantially to costs of development.



Deep drilling operation in Cranfield field, Adams County

For instance, the operator accustomed to judging a sand's merit by looking at a core might find the system unreliable in Mississippi, where often cores superficially observed will show little or no oil saturation. Actual test of the sand may result in a good well. Contrariwise, a core may look good but the sand will fail to produce. In the same way interpretations of electric logs sometimes may be equally misleading. In some areas, the resistivity curves, which on the electric logs, indicate saturation, will turn inward, contrary to normal behavior, rather than outward. The fact that this is not always true complicates the interpretation of such logs when conditions in the area being drilled are not known. For this reason it is necessary to check and double check every zone of porosity that might be encountered.

Continuing development and recent discoveries have enabled operators to obtain a much fuller understanding of the sand conditions and peculiarities. This will make it possible to develop procedures and programs by which the exploration for and exploitation of additional reserves can be expedited and carried on more effectively and efficiently than in the past. As a result, the discovery rate of new fields can be expected to be greatly accelerated.

Individual importance of the newer fields cannot be determined because of limited development. The few fields which have undergone sufficient drilling to prove or indicate their size are or appear to be of major extent. Largest of these to date has been Tinsley, the discovery oil field of the state, which has produced approximately 77,700,000 bbl. of oil, and has a remaining estimated developed reserve of from 35,000,000 to 40,000,000 bbl. Present productive horizons have been drilled up and defined, but a deep Tinsley test now is exploring lower formations. The only other field drilled up in present producing sands is Pickens, second oil discovery of the state, ultimate recovery of which is expected to be around 16,000,000 bbl.

Cranfield Most Consistent

Of the remaining fields, only Cranfield, Heidelberg and Eucutta, which currently are the most active in the state, have received appreciable development. Of these, Cranfield (The Oil and Gas Journal, April 14, 1945, page 102), appears to be the most important from the standpoint of productivity, and possesses the most consistent reservoir conditions and most desirable production characteristics. Both Heidelberg and Eucutta are of relatively large areal extent and will produce much oil, but wells are relatively small, and production is a low-gravity, asphaltic-type crude, undersaturated, and recovered under low-pressure conditions.

Among the fields are several which are known to have sizeable gas-condensate producing areas and reserves. These include Cranfield, Gwinville, Baxterville and Carthage Point. Gas-condensate wells have been completed in two other areas, namely, Hub and Soso, the two most recently opened fields in the state, but in these the discovery wells are the only completions.

Types of production of the various fields are indicated in the accompanying tabulation. Particularly significant is the lack of uniformity in type of production or gravity of the oil for equivalent producing zones in the different fields. In some fields, a certain zone may produce a heavy, asphaltic crude, while in other fields the same zone will yield light gravity, paraffinic-type crude, or gas and condensate.

Producing horizons also are shown in the accompanying tabulation. The most extensive producing formations proven to date have been the Eutaw and Tuscaloosa, lowermost members of Upper Cretaceous age.

So far, there are no through trunk line systems serving the state, and fields have had to depend for their outlets upon local lines or truck hauls to railroad racks, or, in the case of certain fields on west side of the state accessible to the Mississippi River or its navigable tributaries, to barge docks. There is only one refinery in the state, this being a small plant in the Tinsley field, and the crude hauls have been long. In such fields as Heidelberg and Eucutta, which have very little, if any gas, some of the production has been marketed locally as fuel for steam drilling rigs.

Interstate Oil Pipe Line Co. operates local lines and loading racks serving a number of the fields, and is the largest purchaser in the state. This company expects to start work shortly on the first through pipe line out of the state which will be a 140-mile line extending from a point near Brookhaven, in Lincoln County, in the central part of the state, to Baton Rouge, La., and will provide outlet for the Brookhaven and Mallalieu fields, in Lincoln County, as well as Cranfield and other fields which may be opened in the central western and southwestern part of the state.

Field and county—	Discovery year
Amory, Monroe	1926
Baxterville, Lamar	1944
Brookhaven, Lincoln	1943
Bruinsburg, Claiborne	1944
Carey, Sharkey	1941
Carthage Point, Adams	[4]1943
Cranfield, Adams	1943
	1944
Eucutta, Wayne	1943
Flora, Madison	1943
Gwinville, Jeff Davis	1944
Heidelberg, Jasper	1944
Hub, Marion	1945
Jackson, Hinds-Rankin	1930
Langsdale, Clarke	1945
Mallalieu, Lincoln	1944
Pickens, Yazoo-Madison	1940
Soso, Jasper	1945
Tinsley, Yazoo	1939

MISSISSIPPI OIL AND GAS FIELDS

Prod. formation	Depth (ft.)	Type prod. and gravity	No. prod. wells	Div. av. prod. (bbl.)	Accumulated prod. 2-1-44 (bbl.-M.c.f.)	Wells drilling 4-1-44
Hartselle (Miss.)		Dry gas	[10] 0	0	1,500,000	0
Upper Tuscaloosa	7,800-7,900	Gas-cond.	1	250	3,987	5
Basal Tuscaloosa	8,700-8,800	16°-19°	[2] 1			
Basal Tuscaloosa	10,130-300	25°	1	32	20,302	0
Moodys Branch	935-45	Dry gas	1	Dig. fuel[8]	.....	1
Gas Rock (Selma)	3,260-65	25.6°	1	30	42,243	1
Basal Tuscaloosa	10,300-350	Gas-cond.	1	55	2,185	0
Wilcox	5,850-5,900	40°	3	4,300	634,152	8
Basal Tuscaloosa	10,250-400	39°-40°	[5]14			
Eutaw	4,850-5,200	19°-24°	52	3,800	569,216	9
Gas Rock (Selma)	4,360-90	25.5°	1	4	10,115	0
L. Eutaw-U. Tusc.	7,900-8,200	Gas-cond.	3	150	5,531	3
Basal Tuscaloosa	9,200-300	40°	1			
Eutaw-U. Tuscaloosa	4,300-5,200	22°-24°	70	9,500	1,709,881	14
Tuscaloosa stringer	9,125-30	Gas-cond.	1	Shut in	.....	1
Gas Rock (Selma)	2,400-2,600	Dry gas	[6]18	220 M.c.f.	[7]114,000,000	0
Upper Eutaw	3,650-3,700	19°	2	60	1,600	1
Basal Tuscaloosa	10,500-50	38°	2	250	39,648	4
Eutaw	4,800-50	38°	41	6,100	4,723,238	1
Lower Eutaw	6,590-6,600	Gas-cond.	1	Shut in	.....	1
Selma	4,380-5,070	38°				
Eutaw	4,790-5,870	38°	312	27,000	77,695,506	1
Upper Tuscaloosa	6,020-6,120	38°				
			528	51,531	85,458,604	50

(1) Four wells completed; field abandoned in December 1937; (2) includes one upper Tuscaloosa well dually completed in both zones; (3) potential 5,000,000 cu. ft. gas daily; (4) discovery well completed in 1943 abandoned after small production—present well completed in 1945; (5) also gas-condensate (two wells)—gas-condensate area not being developed; (6) 209 wells completed; (7) also produced 14,000 bbl. heavy oil from three wells.

FOUNDED IN 1910 BY PATRICK C. BOYLE

the OIL AND GAS JOURNAL

Leadership In Reverse

THE State of Oklahoma this week established a record for which it has no reason to be proud. Along with an approximate increase of 15 per cent in license fees, owners of 500,000 motor vehicles began paying a 7½-cent per gallon gasoline tax, the highest of any state.

The fact that this tax has been made effective in an oil state where constructive leadership in oil-tax matters was to be expected makes the action the more unexplainable and adds to the seriousness of the precedent established.

With the 1½-cent federal tax, the total tax of 9 cents per gallon represents 40 per cent or more of the retail prices. The tax is 50 per cent more than the producers, pipe-line operators, and refiners in the state receive as their share of the price paid by consumers. The state and federal excise levies are approximately twice the margins that accrue to bulk and service-station operators.

The chronology of Oklahoma's gasoline tax follows the pattern of many other states where the rates are excessive. The tax for years was 4 cents. This was sufficient for the normal maintenance and expansion of state highways. Then a former governor announced the laudable objective of paying off a state indebtedness largely contracted during a previous administration noted for its spending proclivities. While the petroleum industry had not benefited in any way from the spending spree, 1½ cents was added "temporarily" to aid liquidation of the state debt.

The spenders are again in control of the present session of the legislature. They have gained support by bringing into their program needed funds for the operation of schools—a trick as old as professional politics.

Then there was the inducement that the federal Government would supply half of the funds for certain highway construction. Other states will get this handout, it was contended, if Oklahoma passes it up.

There is no surer bait than a Washington gratuity. That a highway will cost the state only 50 cents on the dollar is a clinching argument. The fact that, despite record taxes, we shall end the war with a national debt averaging at least $2,300 per man, woman and child has not convinced the state lawmakers that their constituents pay for federal expenditures just as truly as they do for those of the state and smaller political units.

Representatives of the oil industry who went to Oklahoma City to protest the tax increase were met with the familiar contention: "What are you yelling about? You don't pay it." Actually, of course, an excise tax does not differ from any other type of tax in its economic significance. All are charges against the finished products of an industry paid for by operators and their customers.

Excessive taxes, regardless of the form in which they are made effective, give the customers an erroneous conception of what an industry is actually getting for its products, and this fact becomes of major importance when needed advances in consumer quotations are sought. Furthermore, a 9-cent tax means a bootleg market and further extension of the already scandalous exemption and refund privileges.

The Oklahoma development is discussed here because it is a straw which indicates the way the wind is blowing in state legislation. The oil industry has no greater obligation than the protection of the tax position of its principal product.

INTERNATIONAL

Aviation-Gasoline Unit Approved for Curacao

British interests have been given the cooperation of the Petroleum Administration for War in the construction of a $6,700,000, 100-octane aviation-gasoline refinery unit for the Royal Dutch-Shell plant at Curacao, an island lying off Venezuela, it was announced last week by Ralph K. Davies, deputy administrator.

Construction of the unit is part of the over-all program to meet increased military demands for aviation gasoline. Orders for approximately $1,650,000 of materials to be fabricated in the United States have already been placed. The remainder of the materials will be obtained from Great Britain.

Refining facilities in the Caribbean area, regardless of nationality and ownership, have, in effect, been pooled under the Caribbean area petroleum committee, a subcommittee of the foreign operations committee.

There exists in some quarters an impression, he continued, that equipment for the expansion of the British refineries to meet the war program has been furnished from the United States on a lend-lease basis. On the contrary, British companies have paid cash in United States dollars for all equipment obtained in the United States to be used in refinery expansion projects of a capital nature.

The British Government, purchasing petroleum products from the refineries of its nationals, supplies the U. S. Navy, the U. S. Army, and the War Shipping Administration at many points around the globe with petroleum products as reverse lend-lease and without payment by us.

About half of the 60-odd refineries of the United Nations, exclusive of those in the Soviet Union and the United States, are owned or controlled by British nationals. These processed more than half of the 1,450,000 bbl. of crude oil per day put through all the overseas refineries, exclusive of those of the Soviet Union, in 1944.

Pantepec Says 50 Wells to Be Drilled in Mulata Field

NEW YORK.—Pantepec Oil Co. of Venezuela's share in the drilling and development program for 1945 with Creole Petroleum Corp., provides for use of at least four rigs in the Mulata field of Venezuela and looks to completion of 50 wells, according to W. W. Smith, president in the annual report to stockholders. It is estimated that the potential daily production for joint account at the end of 1945 will be 40,000 bbl.

In the El Roble field the program contemplates operation of one rig for the drilling of three wells.

Areas Previously Held

Commenting on the Pantepec-Atlantic Refining Co. drilling contract, Smith said the areas selected are on concessions previously held by Pantepec: "Development of commercial oil fields can be reasonably expected."

During 1944 there were 8,090,692 bbl. of oil produced for joint interest, an average of 22,106 bbl. a day, compared with 8,543 in 1943. Pantepec's net share of 1944 production (50 per cent less proportionate part of royalty deductions), averaged 8,783 bbl. a day against 3,422 in 1943.

Arabian Peace Delegates To Tour Oil Districts

WASHINGTON.—Officials of the Arabian American Oil Co. will escort the Saudi Arabian delegation to the United Nations Security Conference on a tour through Texas oil fields this week, prior to the delegation's arrival in San Francisco.

The Arabian party, which includes five princes and is headed by H. R. H. Emir Faisal ibn Abdul Azziz, son of Ibn Saud, will visit Houston, Galveston and Corpus Christi. In the Galveston Bay area, the Navy will entertain the party.

The party includes, in addition to the chief of the contingent, the following delegates: His Excellency Shaikh Hafiz Wahba, His Excellency Shaikh Asad El-Fakih, secretary of the delegation Shaikh Ibrahim Suleiman, assistant-secretary Shaikh Saleh El-Abbad, Shaikh Ahmen Abdul Jabbar and Shaikh Ali Alireza, the latter two serving as interpreters.

In addition to the official delegation, the following are in the party: H. R. H. Emir Mohammed ibn Abdul Azziz, H. R. H. Emir Fahad ibn Abdul Azziz, H. R. H. Emir Abdullah El-Faisal, and H. R. H. Nawaf ibn Abdul Azziz.

Officials of the Arabian American company accompanying the Arabian party include Roy Lebkicher, liaison official between the company and the Arabian government, and Marion Martin, vice president.

Sinclair Seeks Concessions In Venezuelan Areas

NEW YORK.—Almost 2,000,000 acres of prospective oil lands in Venezuela will be subjected to exploratory work by subsidiaries of Sinclair Oil Corp. if concessions sought are granted by the Venezuelan Government. The annual report of Venezuelan Petroleum Co., an underlying company of Sinclair, reveals that Compania Consolidada de Petroleo, a subsidiary of Venezuelan Petroleum, is endeavoring to obtain in the state of Monagas concessions on about 111,680 acres at a cost of $1,212,000, or less than $12 an acre.

Royalty Agreed Upon

Sinclair Oil Co., a Venezuelan subsidiary of Sinclair Oil Corp., is endeavoring to obtain 1,843,000 acres in the states of Monagas, Anzoategui, Guarico, Barinas, Apure, and Portuesa at a cost of about $1,300,000. The royalty agreed to be paid ranges from 16⅔ to 20 per cent.

The land in Anzoategui and Guarico, approximately 540,780 acres, was selected on trend. Consolidada has no concessions in these two states. No production has been developed in Barinas, Apure, and Portuguesa.

Consolidada, Sinclair Oil, and Sinclair Refining Co. have agreed with the Government of Venezuela to construct a 35,000-bbl. refinery in that country not later than 1951. In consideration of the agreement the companies are relieved of all duties on materials imported for the plant, may bunker ships free of duty, and are to receive other privileges, some relating to concessions.

Paraffin-Wax Exports to Mexico Restricted

WASHINGTON.—No applications to export paraffin wax to Mexico will receive consideration until the supply situation in this country improves, Foreign Economic Administration announces. When conditions permit resumption of such exports, a Current Export Bulletin will report it.

Applications for licenses to export petroleum and petroleum products to any of the selected destinations except Turkey should be submitted at the beginning of the calendar quarter in which shipment is intended, S. H. Lebensburger, director of the requirements and supply branch, Bureau of Supplies, has announced. Applications for licenses to export all other commodities to such destinations, other than Turkey, should continue to be submitted 45 days prior to the beginning of the calendar quarter in which shipment is intended.

Interests of Petroleum and Natural-Gas Industries Inseparable, Says Hill

WASHINGTON.—Interests of the oil and natural-gas industries are inseparably bound together, and a sound national policy should recognize their oneness, according to George A. Hill, Jr., president of Houston Oil Co. of Texas and chairman of a committee appointed by Gov. Coke Stevenson to aid him in determining this state's policy in connection with hearings on natural-gas conservation to be held by Federal Power Commission.

Hill's recommendations for basic principles upon which he said a national petroleum policy should rest were discussed at a meeting in Washington April 19 of heads of various oil and gas associations with members of the Governor's committee and the national oil policy committee of Petroleum Industry War Council. These principles follow:

"1. That continued vigorous, intensive, venturing of private capital is necessary for keeping up the search for and the finding of oil and gas.

"2. Production of oil and gas has been developed in accordance with sound engineering principles intended to avoid waste, and the conservation laws of the various States, in the exercise of their exclusive jurisdiction to regulate production in accordance with sound conservation principles and within available market demand, has promoted sound conservation and efficient oil and gas field operations.

"3. The Government should (a) encourage the oil and gas industry to assume the risks inherent in oil and gas finding and production by minimizing the risks so far as possible. (b) The Government should not invade the province of the oil and gas industry either by participating with industry in operations, or by itself entering into any phase of the business. (c) As the public interest is protected by law from monopolistic practices, etc., on the part of industry, a proper safeguard can be provided for the protection of the interests of both Government and industry, by appropriate consultations on all actions having to do with policy. (d) Research and technological progress has been the result of competitive research within the oil and gas industry which has constituted a great American achievement and such a dynamic factor in our progress should not be discouraged by the emasculation of our patent system."

Greater emphasis and more complete statement, Hill said, should perhaps be made in a restatement of such policy with respect to (1) state conservation laws and the exclusiveness of state jurisdiction; (2) the Interstate Oil and Gas Compact and its function for research, study and recommendation; (3) the Connally hot oil and hot gas law, and the amendments required to make it equally effective with respect to natural gas in all of its phases; (4) a possible use of the Bureau of Mines for study and recommendation as to certain market demand aspects of natural gas, as well as oil, to state authorities; (5) retention of the federal tax policy on percentage depletion of oil and natural gas; (6) importance of the retention of the option to expense intangible drilling costs of natural-gas and oil wells.

A national oil and gas policy, Hill said, should define the sound and limited jurisdiction of Federal Power Commission over natural gas and the statement of policy should review, factually, the progress of the natural-gas division of the oil and gas industry in relation to production, conservation, technological progress, research, etc.

"When a sound national policy on oil and gas has been formulated, meeting the approval of the various industry associations, and state regulatory authorities and Interstate Oil Compact Commission, it can then be safely regarded as a proper safeguard of the state of Texas, the nation, the public and the industry," Hill contended.

Seasonal Lag in Consumption Aids East Coast Stock Position

WASHINGTON.—Seasonal lags in consumption both of fuel oil and civilian gasoline last week permitted moderate improvement of East Coast stocks despite a lag in movements of petroleum products into the eastern states.

The tank-car movements were 6,442 bbl. a day below the previous week's average and boxcar shipments of kerosene in drums were off 3,674 in the daily average. Barge movements up the Mississippi and Ohio rivers continued at from 75 to 80 per cent below normal.

Military demands, in accordance with prearranged schedules, cut down the number of tankers available for civilian deliveries. The tank-car lag was only 1 per cent below the previous week, which set a 6-months' high record, and flood waters in the Mississippi basin were reflected in the falling-off in barge movements.

Tanker deliveries of civilian petroleum products to the big East Coast ports, which averaged better than 170,000 bbl. daily in March, began to reflect last week the drop resulting from an agreement to release the bulk of the Gulf-East Coast tankers to military service.

Tank car movements of crude oil and products into the East Coast area averaged 540,588 bbl. a day last week compared with the previous week's 547,030 bbl. a day average, the highest since September 16, 1944.

Delivery of kerosene in drums to New England points dropped from 18,733 bbl. daily in the week ending March 31 to 15,059 bbl. a day, due to military demands and a tight car situation.

Crude oil deliveries to eastern refineries through the WEP 24-in. line averaged 300,725 bbl. a day against the previous week's 308,069 while the 20-in. products line jumped to a 231,669 bbl. a day average from its 224,849 daily average for the week ending March 31.

Magnolia, Abercrombie Buy Sun's Old Ocean Holdings

DALLAS.—Sun Oil Co. has sold to Magnolia Petroleum Co. and J. S. Abercrombie Co. oil-producing properties in the Old Ocean field of western Brazoria County consisting of 500.78 acres and 10 wells, for $5,000,000 cash. Sun said the transaction was a joint one, Magnolia and Abercrombie each acquiring an undivided half interest.

Oklahoma Depletion of 27.5 Per Cent Favored

OKLAHOMA CITY. — The Oklahoma House April 17 passed by a vote of 99 to 5 a bill increasing the petroleum production depletion allowance to 27.5 per cent for state income tax purposes. Oklahoma operators are currently authorized to deduct 20 per cent for depletion. Arthur Reed, representative from Poteau, estimated the increased depletion would save Oklahoma operators $200,000 annually in income taxes.

Oklahoma Now Has Highest Gasoline Tax in Nation

OKLAHOMA CITY.—Gov. R. S. Kerr signed a bill on Saturday, April 14, raising the state's gasoline tax to 7½ cents a gallon, the highest in the country. Another measure increases the tax on automobile licenses about 15 per cent.

The gasoline tax became effective April 16, and at service stations that remain open all night long the new tax had to be collected on the first sale made after midnight Sunday. Service station attendants were informed that if they did not get the additional tax, they would be personally liable for it.

Managers of wholesale gasoline plants spent Saturday afternoon notifying their truck salesmen and customers of the new gasoline tax.

Madison Defendants Win Another Appeal

ST. LOUIS.—Major oil companies have just won another decision in one of the antitrust treble damage cases growing out of the now seven-year-old "Madison oil cases."

The decision for the nine defendants was rendered here by the United States Eighth Circuit Court of Appeals in an action brought by two jobbers, Clark Oil Co. and Plymouth Clark Oil Co. of Manitowoc, Wis. The defendant companies were: Phillips Petroleum Co., Sinclair Refining Co., Pure Oil Co., Standard Oil Co. (Indiana), Shell Oil Co., Inc., Socony-Vacuum Oil Co., Skelly Oil Co., Continental Oil Co. and Cities Service Oil Co.

In the action the plaintiffs contended that they had paid a higher price for gasoline as a result of the conspiracy charged in the Madison case, and the Appellate Court in upholding a lower court opinion of Judge Gunnar H. Nordbye of the U. S. District Court in Minneapolis, said:

"Plaintiffs are seeking, not compensation for damages suffered by defendants' illegal acts, but profits because of said acts. Wrong without damage or damage without wrong does not constitute a cause of private action . . . The Sherman Act and the Clayton Act afford a cause of action for those suffering damages. In their provisions for damages they embody both punitive and compensatory damages but no recovery can be had unless a case for compensatory damages is made." The court referred to other treble damages cases which have been rendered in favor of the major oil companies and said, "We think the decision of the trial court is in accord with the authorities."

The importance of this case is indicated by the fact that it is said to involve the outcome of 16 companion cases pending in the U. S. District courts in Minneapolis and St. Paul.

Senate Action Pending on Oklahoma Unitization Bill

OKLAHOMA CITY. — The Oklahoma unitization bill, heralded by its sponsors as a constructive step in promotion of petroleum conservation and secondary recovery, this week awaited Senate action.

The Senate oil and gas committee held a hearing April 16 at which only minor amendments were requested by one substantial operator. A majority of operators appearing before the committee favored the legislation, citing the opportunities it affords for increasing recovery from existing pools and new fields yet to be discovered.

The bill, as passed by the Oklahoma House, permits initiation of unitization application to the Corporation Commission by owners of 50 per cent of the acreage in a fully defined pool. Veto power rests with 15 per cent of the acreage owners, if initiated within specified time limits. The bill does not apply to pools producing from average depths of less than 3,500 ft. nor to fields in which the discovery well was completed 20 years or more before date of enactment.

PIWC Renews Plea to Turn in Steel Scrap

WASHINGTON.—Reporting a growing shortage of heavy melting scrap needed to insure continued operations of steel mills, the Petroleum Industry War Council last week urged the industry to conduct a general cleanup campaign in fields and plants, with emphasis upon breaking down junk and obsolete material.

Allen H. Hand, executive secretary-treasurer of PIWC, urged cooperation with the Conservation and Salvage Division of WPB.

DEATHS

Stephen M. Birch, 50, advertising manager of The Texas Co. since 1938, died April 10 in New York.

Allen Williams, 41, oil operator and geologist, died April 8 in Houston. Williams was educated at Oklahoma A. & M. College and University of Oklahoma. He was district geologist for Midstates Oil Corp. in Houston until 1943, when he opened an office as consultant.

W. H. Lassen, 49, oil operator of Wichita, Kans., died April 10 of injuries suffered in an automobile accident near that city.

Michael B. Carmody, 78, active in natural-gas operations until his retirement in 1920, died April 7 in Shreveport. Carmody took part in early gas developments of New York, Pennsylvania, West Virginia, and Ohio, including the famous Richburg, N. Y., field. He supervised many transmission and distribution systems in those areas.

Frank Morris, 54, oil operator and lawyer, died April 10 in Dallas. In 1936 and 1938 he was a candidate for The Texas Railroad Commission.

Frank D. Williams, 89, retired president of National Transit Co., with which he was associated 54 years, died April 10 in Oil City, Pa. He began his career in pipe-line work as a telegraph operator for Union Pipe Line at Foxburg, Pa. Promotions followed, and he was sent to Japan by Standard Oil Co. to oversee construction of a pipeline system. Upon his return he was assigned to posts of increasing responsibility in National Transit, becoming president in 1920, and holding that position until 1930, when he retired.

Raymond Haskell, 66, of Summit, N. J., consulting engineer for The Texas Co., died April 7. He received B.S., M.S., and Ph.D. degrees at Massachusetts Institute of Technology and a degree in chemical engineering at Clarkson College. He had been in Texas service since 1919.

A. Steve Clay, 39, president of Southeastern Pipe Line Co., was killed April 14 in the crash of a Pennsylvania Central Airlines plane near Morgantown, W. Va. He was a member of the law firm Hirsch, Smith, Kilpatrick, Clay & Cody, of Atlanta.

Max C. Douthit, 32, of Custer City, Pa., leaseman for Minard Run Oil Co., died April 11.

A. L. Allstott, 60, retired wire chief for Humble Pipe Line Co., died April 10 in Kerrville, Tex.

Hey, do you know those guys in the lab are paying 325 dollars a pound for rock salt?

That's right, fellow, the prism in the infrared apparatus for hydrocarbon investigations at the UOP laboratory is made of a common salt crystal. Rock salt crystals transmit light better than ordinary glass lenses. They are very sensitive and require expensive technique in manufacture and polishing.

The infrared spectrometer is only one of the many scientific tools used by the UOP technologists in their studies to develop new and improved products.

CATALYTIC CRACKING
CATALYTIC REFORMING
HYDROGENATION
ALKYLATION
ISOMERIZATION

THERMAL CRACKING
THERMAL REFORMING
HYDROFORMING
DEHYDROGENATION
POLYMERIZATION

RETREATING
POLYTREATING
U. O. P. CATALYSTS
UNISOL TREATING
U. O. P. INHIBITORS

Universal Oil Products Co.
Chicago 4, Ill., U. S. A.

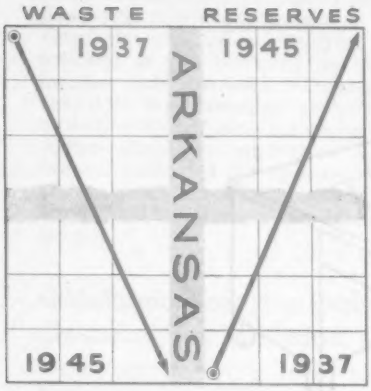
UOP

Petroleum Process Pioneers
For All Refiners

The Refiners Institute of Petroleum Technology

Copyright 1945, Universal Oil Products Co.

Arkansas Is Proving Ground for Many New Practices Over the Past Eight Years



In the Arkansas oil and gas industry there are:

FIELDS: 26 of the newer "controlled" oil fields and 8 gas-condensate fields . . . 48 oil and gas pools altogether in the southern part of the state.

GASOLINE PLANTS: 11 operating plants, manufacturing per day 112,854 gal. of gasoline and 114,282 gal. of butane and propane. Total gas processed daily is 159,864,000 cu. ft. At two of the plants sour gas is desulfurized to make it marketable . . . adjacent to one is a plant manufacturing solid sulfur from the hydrogen sulfide content.

REFINERIES: 8 refineries, processing 42,178 bbl. of crude daily. Complementary to one is an aviation-fuel plant, to another a butadiene plant for rubber manufacture.

by Kenneth B. Barnes

EVENTS accomplished by sound exploration, drilling, and conservation work in the last 8 years have placed Arkansas in a firmly established and well-balanced position as one of the important oil-producing states. An impressive aggregation of oil, condensate, and gas reserves has been found in the Lower Cretaceous and Jurassic formations of the four southernmost counties of the state. Under scientific guidance, these new reserves are steadily being produced by programs yielding exceptionally high recovery efficiencies. The large majority of Arkansas' present production of 80,000 bbl. per day and of her proven reserves of approximately 325 million barrels is the result of the 8 years' work.

Operating under what often are termed model conservation regulations, some of the most advanced producing technology is found in a number of the pools. This article will describe, in summary form, different phases of interest which in total make up Arkansas' present producing status.

Record Prior to 1937

The El Dorado south pool was discovered in 1920. Productive from the Nacatoch sand of the Upper Cretaceous, it has produced 49,346,784 bbl. Two years later, Smackover, one of the "wonder" pools of the twenties, was brought in with the Nacatoch, Graves, and Tokio sands (Upper Cretaceous) being the pay formations. Smackover cumulative is 402,638,352 bbl., and 1944 average was 11,725 bbl. per day.

Some 10 other pools were developed in the interim to 1937, nearly all in the Upper Cretaceous. As a whole, the production from these older pools is still substantial, but there are numerous economic and operational problems connected with them. During the past 2 years the state has fostered a survey of this stripper production with reference to possibilities of secondary-recovery application. The work is being done by G. H. Fancher and others under the direction of the state bodies.

A map showing the Arkansas oil and gas pools, together with trunk oil pipe lines, is given in Fig. 1.

Fig. 1—Southern Arkansas oil and gas-condensate fields and oil pipe lines. (The gas-condensate fields are crosshatched.) —From A. M. Crowell's map of East Texas-Arkansas-North Louisiana-Mississippi, courtesy Mid-Continent Map Co., Houston

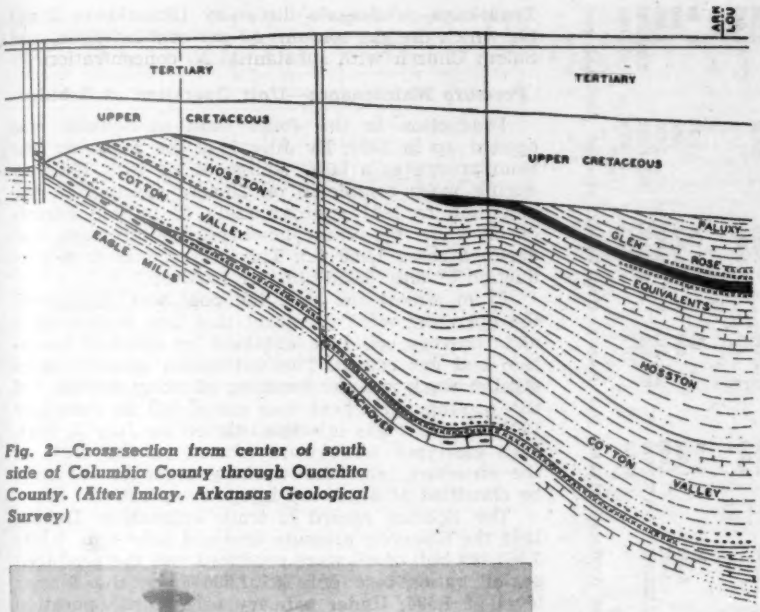


Fig. 2—Cross-section from center of south side of Columbia County through Ouachita County. (After Imlay, Arkansas Geological Survey)

Left: Newest gasoline plant in Arkansas—the Midway installation of Barnsdall Oil Co. The plant was placed in operation in August 1944, and has a capacity of 25,000 gal. gasoline and special products per day. Below: Pressure plant for the first water injection-pressure maintenance operation, located on the S. E. Bond discovery lease at Midway. Produced salt water plus fresh water from seven 250-ft. wells are gathered at receiving tank; the pressure plant pumps the water to four flank-location input wells

Development Starting With 1937

The Cotton Valley and Smackover formations have provided the pays of the new era of discoveries. Some of the pays are sands, others are oolitic limes. A number carry local names, as the "Morgan" and the "Jones" sands of the Cotton Valley formation in the Schuler pool. In 1937 the 1 Reynolds of Phillips Petroleum Co. in the Snow Hill area of the Smackover field found the first production in the Smackover limestone formation. The pay was in a porous oolitic section at the top, and the zone since has been termed the Reynolds lime.

The Lower Cretaceous and Jurassic formations, which have been treated in detail by a number of members of the Shreveport Geological Society,[1] Imlay,[2] and Thigpen,[3,4] are mostly nearshore, shallow water deposits, which exist structurally in southern Arkansas as a monocline dipping to the south and southwest. On the major structural feature are the localized anticlinal uplifts and domes which influenced oil accumulation, and some of which make up the new "back bone" of reserves discussed here. Almost all have been located as a result of seismographic exploration. A regional cross-section, from the center of the south side of Columbia County through Ouachita County, is given in Fig. 2.

Principal Pools

Pools with substantial production from Cotton Valley sands include Schuler, Dorcheat-Macedonia and New London, with Schuler considerably the largest as an oil reserve. Of the Smackover limestone pools, which have the Reynolds oolitic zone as the principal or only pay, the Magnolia and Midway fields have the largest production and reserves. In Table 1 are given, for Schuler, Magnolia, Midway and eight other pools, average data for subsurface conditions, reservoir character, producing performance, and other pertinent information. Other interesting pools include the

TABLE 1—PRINCIPAL NEW ARKANSAS POOLS, AVERAGE DATA FOR SUBSURFACE CONDITIONS, RESERVOIR CHARACTER, PRODUCING PERFORMANCE (ARKANSAS OIL AND GAS COMMISSION)

Item or factor—	Atlanta	West Atlanta	Buckner	Dorcheat-Macedonia†	Haynesville (Ark. part)	Magnolia	McKamie	Midway	Mount Holly	Schuler (Jones)	Schuler (Reynolds)	Village
Township	18s-19w	18s-19w	16s-22, 23w	18s-22, 21w	20s-20w	17s-19, 20w	17s-23w	18s-24w	17s-18w Union	18s-17, 18w Union	18s-17, 18w Union	17s-19w Columbia
County	Columbia	Columbia	Col.-Lafay	Columbia	Columbia	Columbia	Lafayette	Lafayette	Lafayette	Union	Union	Columbia
Structure: top of pay	AF, —7,950′	AF, —7,950′	AF, —6,900′	AF, —8,650′	AF, ...	AF, —7,150′	AF, —9,000′	AF, —6,050′	AF, —6,910′	AF, —7,300′	AF, —7,350′	AF, —7,050′
Producing formation	Reynolds	Reynolds	Reynolds	Reynolds	Pettit	Reynolds	Reynolds	Reynolds	Reynolds	Jones	Reynolds	Reynolds
Gas-oil contact	—7,943	—7,976	No gas cap	—8,638; all gas	No gas cap	7,138; 7,246	Gas phase	No gas cap	—6,921	—7,280	—7,394	—7,101
Oil-water contact	—8,000	—8,000	—7,010	—8,650; —8,660	None	—7,293, —7,328	.....	—6,225	—6,943	—7,380	—7,420	—7,123
Net pay thickness, ft.	30	30	30	12′ oil; 75′ gas	0-31	67	100	25-175	10-22	37.5	20	20
Porosity, average (per cent)	15	14	20	15.4; 14.0	0-23	16.8	17	24	20	17.6	20	20
Permeability, av. md.	1,276	1,200	50	200	0-50	1,500	400	150	1,130	305	1,500	2,000
Connate water, est. per cent	25	40	23	30; NT	NT	20	20	19.7	25	15	20	20
Oil, volume factor	1.39	1.72	1.20	.....	.....	1.44	.....	1.24	1.54	1.52	1.59	1.43
Oil gravity, °A.P.I.	44°	44°	32°	43°; 62° cond.	39°	38°	58°	36°	43°	34°	38°	41°
G.O.R. original	837	1,291	300	1,150	400	700	8,900	283	2,120	760	760	1,376
G.O.R. present	1,684	1,083	289	16,350	1,165	907	5,536	313	1,717	*2,897	2,193	1,772
B.hp., original (p.s.i.)	3,831	3,483	3,195	4,243; 4,130	2,344	3,465	4,365	2,920	3,180	3,520	3,550	3,350
B.hp., present	3,120	3,211	2,361	2,710; 3,053	1,752	2,878	.....	2,659	.....	1,449	.....	3,065
No. producing wells	23	13	59	69	29	112	19	41	12	130	14	20
Alloc. acreage	920	518	1,170	4,880	2,320	4,363	3,040	1,639	480	2,944	566	800
Allowed, first quarter 1948, bbl. per day	2,142	1,205	1,897	Plant Dem.	2,212	14,211	3,040	7,895	1,015	59,000	1,609	2,500
Cumulative production	4,682,849	250,740	4,722,272	‡4,126,897	743,832	36,280,150	3,133,948	5,771,510	656,858	33,074,345	5,351,492	2,569,022
Est. orig. reservoir oil in place, million bbl.*	23.8	.....	43.3	21.8; 24.0	.....	360.0	.....	180.0	10.5	12.5	34.4	18.8

Note: AF = anticlinal fold. *From Bruce[5]; Schuler (Jones) from Kaveler.[6] †Dorcheat data are first. ‡Pool also has produced 2,112,658 bbl. from Cotton Valley, allowed 3,457 bbl. per day. §Net = 164.

Texarkana condensate discovery (Smackover lime) for which the gas contains 50 per cent nitrogen, and Salem Church with substantial N_2 concentration.

Pressure Maintenance—Unit Operation at Schuler

Production in the Jones sand at Schuler was opened up in 1937. By July 1940 the reservoir had been proven as a large source of oil with 146 producing wells completed on 20-acre spacing. In the operation to 1941 approximately 19 million barrels of oil were produced; however, the pressure had declined some 1,950 psi. This corresponds to a production of only 9,750 bbl. per lb. drop.

From almost the time the pool was discovered, the operators were cognizant that best performance and recovery could be obtained by unitized operation and gas return. The unitization involved substantial work and the handling of many details, but the pooling agreement was completed in February 1941, and first gas injection started on July 1, 1941. Five gas-input wells were located on the crest of the structure, and the working arrangement may be classified as a gas-cap injection operation.

The Schuler record is truly impressive. During 1944 the reservoir pressure declined only 4 lb. while 3,567,489 bbl. of oil were produced and the produced gas-oil ratios rose only to 1,606 from the former level of 1,584. Under primary production operation the indicated yield had been only some 34 million barrels, but with the gas-return practice the ultimate recovery expectancy now appears to be approximately 54 million barrels. Kaveler,[6] Weeks and Alexander,[6] and Elliott[7] have presented comprehensive reports of the engineering features and geologic factors concerned with the Schuler operation.

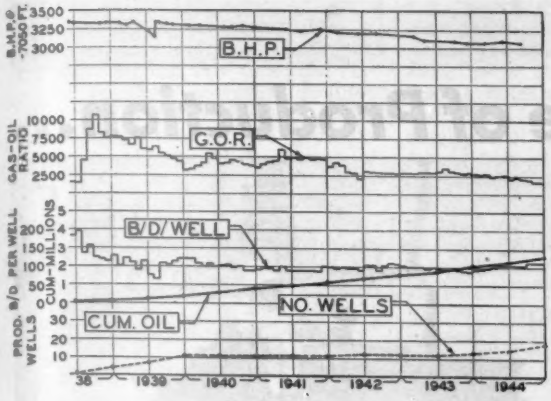
As may be seen in Table 1, the Smackover limestone pools differ sharply among themselves in reservoir conditions and other factors, as mong pools. As illustration, the Midway and Buckner fields contain crudes which are undersaturated with gas, while saturated crude and free gas caps are found at Atlanta, Magnolia, Mount Holly, Schuler and Village. Gas-condensate production characterizes the Dorcheat-Macedonia and McKamie fields.

Bruce[5] has discussed the Smackover limestone formation as to a most interesting alignment of geological and production features. From the updip unconformity or pinchout of the Smackover, (which occurs on an east-west strike some 15 to 20 miles north of the Midway pool) on downdip southward into North Louisiana to depths of 10,000 ft. and more, the pay section is from a few feet to 300 ft. thick, and filled with salt water except for the hydrocarbon accumulation in the highs. There is no known outcrop. The water-bearing section is termed an aquifer, and it was shown that nearly all of the Reynolds lime pools have a uniform relation between original pressure and depth; also, that water from the aquifer is moving into all of the producing Reynolds lime pools. Table 2 shows the cumulative water influx which was calculated for a number of the pools.

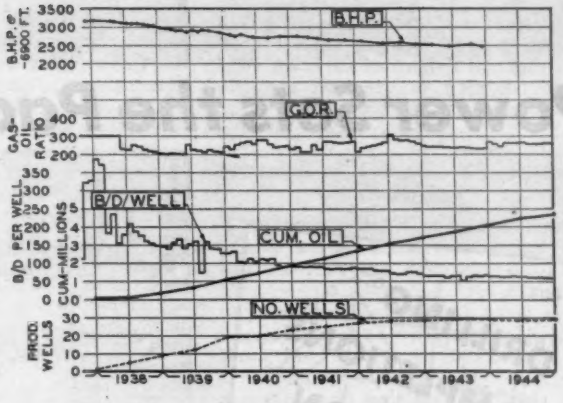
In the same work, Bruce describes results of investigations of the reservoir behavior of several of the pools by the electrical analyzer method.

Midway Pool and Water Injection for Pressure Maintenance

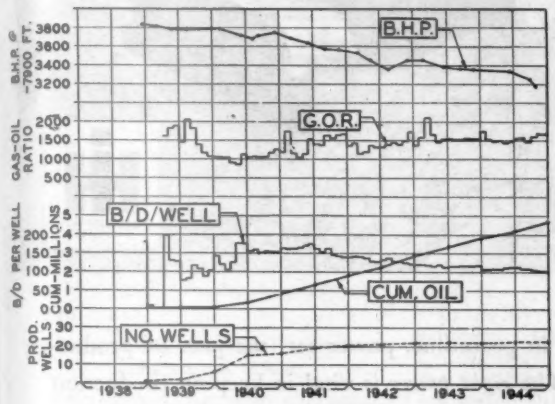
One of the most important recent developments in petroleum-production practice is the maintenance of pressure in the large Midway pool by the injection of fresh water, designed by Horner and Snow[8]. Original reservoir pressure was 2,920 psi. Saturation pressure of the crude oil is 2,528 psi. As the first production was taken from the pool the reservoir pressure declined rapidly to 2,675 psi., and further drop to below the bubble point was indicated to be



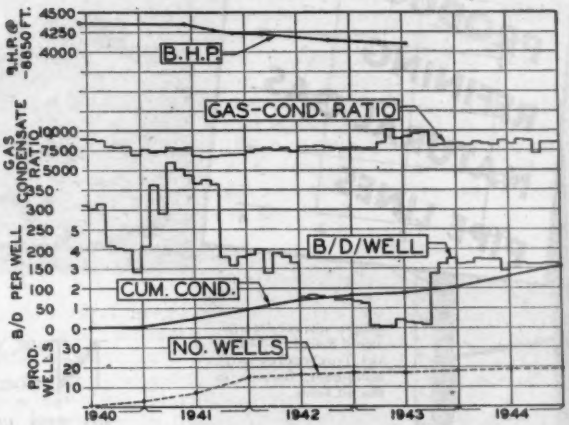
VILLAGE



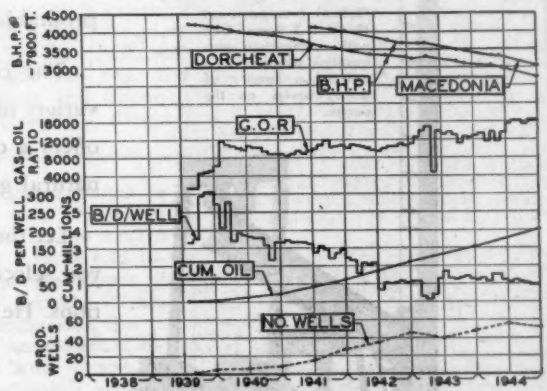
BUCKNER



ATLANTA



McKAMIE



DORCHEAT-MACEDONIA

Fig. 3—Pressure-production data charts. (From factual data issued by Arkansas Oil and Gas Commission)

TABLE 2—WATER DRIVE INTO SMACKOVER LIMESTONE POOLS, CALCULATED BY MATERIAL BALANCES*

Pool—	Cumulative water influx, million bbl.
Atlanta	5.49
Big Creek	2.51
Buckner	4.86
Dorcheat	2.10
Magnolia	24.50
McKamie	3.34
Midway	1.84
Mount Holly	0.69
Schuler	10.15
Texarkana	0.55
Village	8.15

*From Bruce,[8] data as of June 30, 1943.

imminent. Injection of extraneous water to the producing formation, at a point downdip from the oil-water contact, was started April 19, 1943. In a short time the previously declining trend of pressure was substantially arrested.

Four water-injection wells are now in use, all having been converted from dry holes which were obtained in delineating the productive area. The extraordinary performance of the project is well illustrated by the record during 1944, when 2,378,989 bbl. of oil were produced while the reservoir pressure actually increased 38 p.s.i.. Ultimate recovery was indicated to be on the order of 28 million barrels without injection, but with injection, data are reported to show the ultimate will be about 67 million barrels.

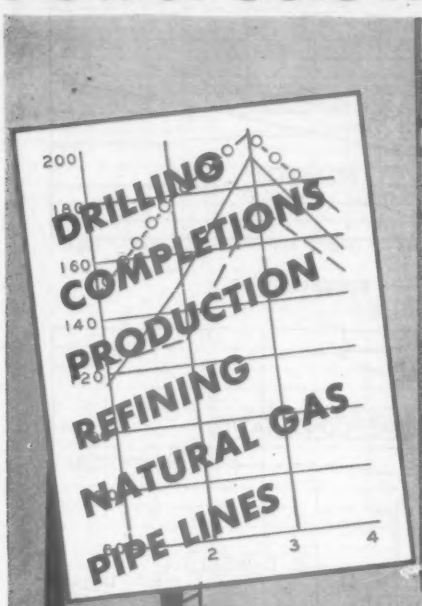
The Midway water-injection project is a cooperative arrangement among six operators, with the investment and operating costs apportioned as to oil in place on a per-acre-foot basis. Present cumulative water input is 3.2 million barrels. A practical aspect to the operation is that higher rates of production have been justified by the performance data, and commensurate allowables have been granted.

It is to be noted that the principle is not the same as covered by the usual type of applied water drive, but rather is an augmentation of the normal water influx for the sustenance of pressure. In fact, the procedure at Midway makes the pool practically independent of the limitation of natural water drive.

Magnolia Pool Also to Use Water Injection

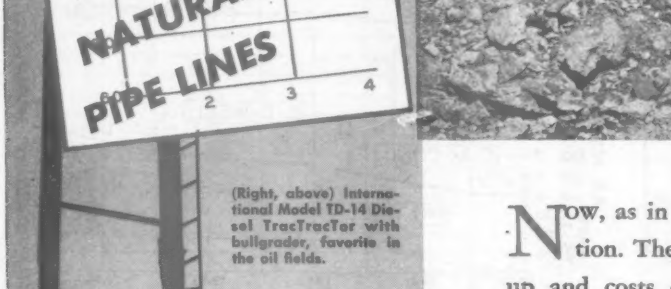
Magnolia, both from the standpoint of current production and future reserves, is the most important

Power Sets the Pace of Production...



(Right, above) International Model TD-14 Diesel TracTracTor with bulligrader, favorite in the oil fields.

(Below) International Model U-2 Power Unit with combination gas-gasoline attachment is one of a family of money-savers on the pumps.



Now, as in peacetime, power sets the pace of production. The *right power* is vital in keeping production up and costs down. International Power—TracTracTors, Industrial Wheel Tractors, and Power Units—will aid in profitable and efficient production now as it always has.

The complete line of International Power includes a variety of sizes and types to meet your requirements. Each offers a choice of *full Diesel* or gasoline engines—plus a natural gas-gasoline conversion for power units.

Let the International Industrial Power Distributor help you select the correct International Power for your operations. He can help you in making out your application if you require new equipment. Take good care of the International equipment you have. Keep it properly serviced. Equipment conservation, always important, *is doubly so for the duration.*

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

INTERNATIONAL POWER FOR THE OIL INDUSTRY

pool in Arkansas. During 1944 it produced an average of 15,250 bbl. per day. During this time the reservoir pressure, however, declined only from 2,972 to 2,880 p.s.i. An engineering study of the pool has been made by the U. S. Bureau of Mines.[10]

Recently a program for water injection to the flanks of the producing formation has been formulated. Salt-water production will be returned to the reservoir through some four strategically located wells, together with any additional fresh water that may be deemed desirable. The input wells will be drilled especially for injection purposes. The first one already has been completed and tested. Preliminary experiments show it to have a high injective capacity.

Village, Buckner and Atlanta

The Village field has an excellent water drive and trends of pressure and gas-oil ratio in recent years can be seen in Fig. 3. During 1944 pressure decline was only 23 lb. (from 3,088 to 3,065 p.s.i.). Produced gas-oil ratio was reduced from 2,850 to 1,772. Charts of operating data for two other Smackover lime fields—Buckner and Atlanta—also are given in Fig. 3.

McKamie and Dorcheat-Macedonia Condensate Field

Two large gas and condensate pools in Arkansas are McKamie and Dorcheat-Macedonia. In Fig. 3 are shown production - pressure charts for both.

At McKamie, the condensate production is accompanied with sour natural gas. The hydrogen sulfide content is approximately 4,300 grains or 0.6 lb. per 100 cu. ft. In order to process the gas for domestic and industrial uses, a combination gas-desulfurization and gasoline plant was installed and is being operated by McKamie Gas Cleaning Co. Approximately 3,000 bbl. of condensate is being produced per day by the 19 wells in the field, together with about 25,000 M.c.f. of gas.

The hydrogen sulfide is removed from the gas by the Girbotol process, the gas being brought into contact with a solution of monoethanolamine and water. Treated gas is reduced to a very low hydrogen sulfide content. The gas is also dehydrated by diethylene glycol units for pipe-line deliveries.

Adjacent to the gas-cleaning, gasoline - manufacturing operation, a plant for the recovery of free sulfur has been installed and is operated by Southern Acid & Sulfur Co. The molten sulfur recovered is piped to forms for solidification. The product subsequently is removed and broken up for rail shipment.

McKamie also has one pumping well which has been productive from the Cotton Valley sand.

Dorcheat-Macedonia produces from sands in the Cotton Valley and from the Reynolds oolitic of the Smackover. Dual completions have been employed in many of the wells, with segregation of the production from each formation. Jordan and Crowell[11] have described cost comparisons and savings in steel engendered by the dual completions and have given a schematic layout of a typical installation.

Sour gas also accompanied the condensate production in this pool, and a gas desulfurization plant is in operation to reduce the hydrogen sulfide content. The plant is operated by Arkansas Fuel Oil Co. A flow sheet of the plant layout, which includes equipment used in the manufacturing of natural gasoline and liquefied petroleum products, has been described.[12]

Other Arkansas Pools

The Smart area of the Stephens pool is a sizable reserve, having 100 producing wells with a current total allowable of 6,578 bbl. per day. Discovered in 1941, production is from the Hosston sand of the Lower Cretaceous; depth is approximately 3,400 ft.

In the Haynesville pool, located in southern Arkansas and northern Louisiana, 16 companies have formed the Haynesville operators committee which will conduct a gas-return pressure-maintenance project in the Pettit lime pay. Depth is 5,500 ft. A total of about 160 producing wells is involved. A new high-pressure absorption plant is nearly complete which will handle the 14,000,000 cu. ft. of input gas per day, and manufacture gasoline and liquefied petroleum gas products. Original bottom-hole pressure was approximately 2,400 p.s.i., it is now about 1,600 p.s.i. An estimated increase in ultimate recovery of 5,000,000 bbl. of oil and 300,000 bbl. of light products has been reported.

In reserves, proven total in Arkansas was only 87 million barrels in 1936. In the next 8 years occurred a three-fold increase, to the present figure of 325+ million barrels. From these new discoveries, on a scientifically controlled, restricted basis, now comes 75 per cent of the state's production of 80,000 barrels per day.

In increased recovery, the gas-injection program at Schuler is estimated to eventually yield 20 million barrels over primary operation . . . at Midway the water injection-pressure maintenance to add 39 million barrels . . . Salt water return and injection of extraneous water also is about to be started at Magnolia, the state's largest single reserve . . . Gas return to the Pettit Lime is starting at Haynesville.

Functions of Arkansas Oil and Gas Commission

Mention already has been made of the model conservation legislation in effect in Arkansas. This is comprehensively and realistically covered by the general rules and regulations[13] and other work of the Arkansas Oil and Gas Commission.

Statistical reports are issued monthly and engineer's reports of factual data are made quarterly. Permissive allowables are set for periods of 3 months after hearings have been held on the data and the manner of operation indicated for most efficient recovery. Special reports on pertinent field matters and status are issued. A review in 1940[14] of the prudent conservation and wise use of Arkansas oil and gas resources covers many details of the work.

References

1. Shreveport Geological Society: "Guide Book, 14th Ann. Field Trip, Upper and Lower Cretaceous of Southwest Arkansas," (25 papers, 1939).

2. R. W. Imlay: "Lower Cretaceous and Jurassic Formations of Southern Arkansas," Arkansas Geol. Survey Info. Circ. 12 (1940).

3. C. H. Thigpen: "Possibilities of the Cotton Valley Formation in Arkansas," The Oil and Gas Journal, Feb. 4, 1943, p. 62.

4. C. H. Thigpen: "Possibilities of the Smackover Limestone in Arkansas," The Oil and Gas Journal, Feb. 11, 1943, p. 85.

5. H. H. Kaveler: "Engineering Features of the Schuler Field and Unit Operation," Trans. A.I.M.E., Vol. 155 (1944), p. 58.

6. W. W. Weeks and C. W. Alexander: "The Schuler Field," Bull. A.A.P.G. No. 26 (Sept. 1942), p. 1467.

7. G. R. Elliott: "Geologic Factors in Unitized Pressure Maintenance, Jones Sand Reservoir, Schuler Field, Arkansas," Bull. A.A.P.G., Vol. 28, No. 2 (Feb. 1944), p. 217.

8. W. A. Bruce: "Study of the Smackover Limestone Formation and the Reservoir Behavior of Its Oil and Condensate Pools," Trans, A.I.M.E., Vol. 155 (1944), p. 88.

9. W. L. Horner and D. R. Snow: "New Application of Water Injection for Maintaining Reservoir Pressure and Increasing Natural Water Drive," Proceedings, A.P.I. (1943), p. 226; also, The Oil and Gas Journal, Nov. 11, 1943, p. 226.

10. C. B. Carpenter and H. J. Schroeder; A. B. Cook: "Magnolia Oil Field," Part 1. Petroleum Engineering Study, Part 2. Derivation and Application of Material-Balance Equations, U. S. Bur. Mines, R.I. 3720 (Sept. 1943).

11. L. L. Jordan and Alec Crowell: "Dually Completed Arkansas Wells Save Money and Critical Equipment," The Oil and Gas Journal, Dec. 16, 1943, p. 34.

12. "Columbia Treating Plant Converts Waste Gas to Useful Fuel Products," The Oil and Gas Journal, July 22, 1943, p. 20.

13. Order No. 2-39, Arkansas Oil and Gas Comm., El Dorado, Ark., Price 75 cents.

14. "Midyear 1940 Survey of the Oil and Gas Industry," (A. M. Crowell), Arkansas Oil and Gas Comm.

Field Testing of Drilling Muds

*by Vernon B. Zacher**

This paper is a treatment of some aspects of instruments and methods used in mud testing and control as applied at drilling rigs. In addition, various mud problems are discussed—their relation to drilling operations and the treatment thereof. It was presented before the American Petroleum Institute, Pacific Coast district, production division, at Los Angeles, March 29.

ALTHOUGH many excellent papers have been written on drilling fluids, many of these never got beyond the laboratory. Papers such as Cheney's, which bridge the gap between laboratory and field, are fine contributions.

Additional information on new instruments, chemicals, and procedures, to be applied directly at a drilling rig are presented.

Chemical Testing Kit

Fig. 1 illustrates a test kit which has resulted from work done to provide an adequate apparatus that allows easy determination of the important properties of muds. The kit provides a test for calcium and most of the other important ions in a filtrate. The following limitations had to be overcome to make the kit applicable on a drilling rig:

1. Provide means of getting a complete test on a small amount of solution, actually semimicro in character. This kit requires only 13 cc. of solution. Actually, to check the main trouble-making ions in mud, such as the calcium, magnesium, chloride, sulfates and possibly sodium, requires only 5½ to 6 cc. of filtrate.

*Test engineer, Tide Water Associated Oil Co.

2. It must be sufficiently portable to carry in a car and on to a rig. The arrangement must not hinder fast work (bottles must be handy). Further, the kit must be complete and independent of rig appliances.

3. Filtrate must be clear for colorometric tests. Quebracho color is removed by boiling with activated carbon.

4. Arrangement of parts is necessary to give speed, accuracy and cleanliness. Speed of test for 14 ions is about 20 minutes.

5. Simplicity is necessary, and by it various people can check with each other. The results of one kit must be comparable with that of another.

6. Provide space to carry accessories such as weighing spoon, stopwatch, thermometer, alcohol lamp, filter papers, and key book containing color data.

7. Provide space for sufficient amounts of treating chemicals, such as quebracho, phosphates, etc. Eighteen reagent bottles are carried as well as 11 bottles of treating chemicals. In addition, 14 empty 15 cc. bottles are carried ready to receive the sample. In all, there is a total of 45 bottles so that cabinet design and bottle selection proved important.

The kit may be devised using any approved semimicro colorometric method. The claim of quantitative results is not made; however, quality of color is quantitative in a limited way. Conservatively, the results are easily discernible as to large, medium or small amounts. If accurate quantitative results are required, a colorimeter is necessary. If there is a question concerning accuracy of the method of using filtrate to measure total ions in the colloidal system, this is not claimed. Actually, any ions present in the filtrate represent an excess not adsorbed on the clay particle. If any excess exists, it is important because it is available to damage clay or water. Thus, if any calcium is found in the filtrate it is important. The same holds with other impurities.

Fig. 1—Kit of mud-treatment chemicals. The kit is sufficiently portable to carry in a car and on to a rig. Bottles are kept handy, and the kit is complete and independent of rig appliances. It provides adequate apparatus for easy determination of important properties of muds

Added Services Suggested

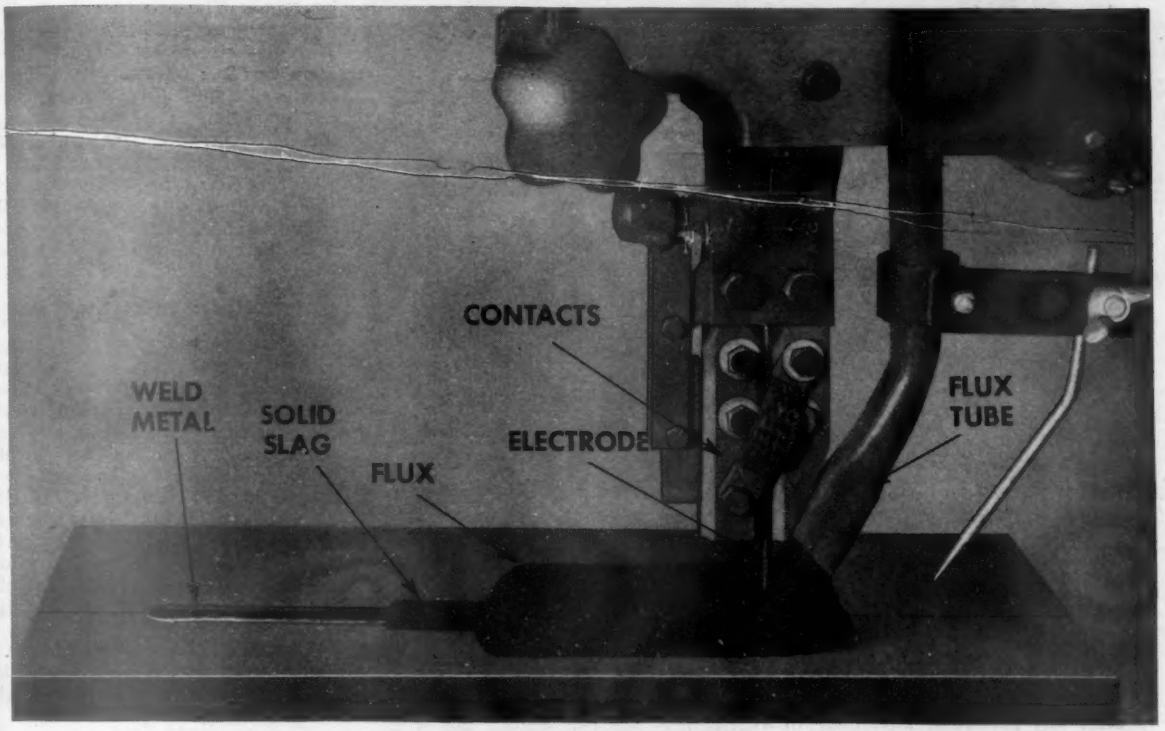
New jobs not contemplated for the tester have come to light after moving to the field. These are: (1) Test on boiler waters; (2) test on soils, or waters leached therefrom; (3) tests on formation soils, or water leached therefrom; (4) tests on water from oil well cores; (5) tests on formation waters; (6) tests on mixing waters for muds; (7) tests on filtrate from new clays for rotary mud.

The ionic method of reporting salts is simple and direct. Unless it is necessary to characterize the salt causing these ions, hypothetical groupings are actually unnecessary. Results are expressed in pounds per barrel; to convert to parts per million, multiply by 2,950.

Mud tests are important because the quality of a mud is dependent on soluble salts in the: (a) Mixing water; (b) rotary clay; (c) formation waters, and (d) formation.

"IMPROVEMENT...the key," *he said*

Look, how Lincoln has improved the Shielded Arc Welding Process:



The Pioneer of Shielded Arc Welding Announces "LINCOLNWELD"

. . . key to better welding at lower cost

Shielded completely under a blanket of flux, the arc of "Lincolnweld" brings to the welding world new high standards of *speed, quality* and *economy*. Here are a few of the many advantages of this new Lincoln Automatic Metallic Shielded-Arc Process . . . reported by many users for a wide variety of applications:

VERSATILE. Same flux . . . same electrode . . . same procedure . . . can be used for wide range of steel analyses. With simple change of electrode size, same equipment welds thin sheets or heavy plates.

EASY TO WELD HORIZONTAL FILLETS. Simple to change from butts to fillets or laps. Deep-root penetration combined with high welding speeds assure welds of higher quality at lower cost.

PRODUCES HIGH QUALITY WELDS. "Lincolnweld" Flux gives quality results even in many steels of poor weldability.

ARC CONTROL IS SIMPLE. Balanced voltage type d.c. control . . . highly sensitive yet rugged and dependable.

TAKES WIDE RANGE OF ELECTRODE SIZES. Accommodates ⅛" to ⅜" electrode without change in head or control.

NOT SENSITIVE TO POWER LINE VOLTAGE VARIATIONS. Assures weld uniformity at all hours of day or night even though there may be voltage variations in shop power.

A booklet has been compiled giving "Lincolnweld" facts, procedures and results in a variety of applications. A free copy is yours for the asking.

THE LINCOLN ELECTRIC COMPANY • DEPT. C-2 • CLEVELAND 1, OHIO

America's greatest natural **recourse**

ARC WELDING

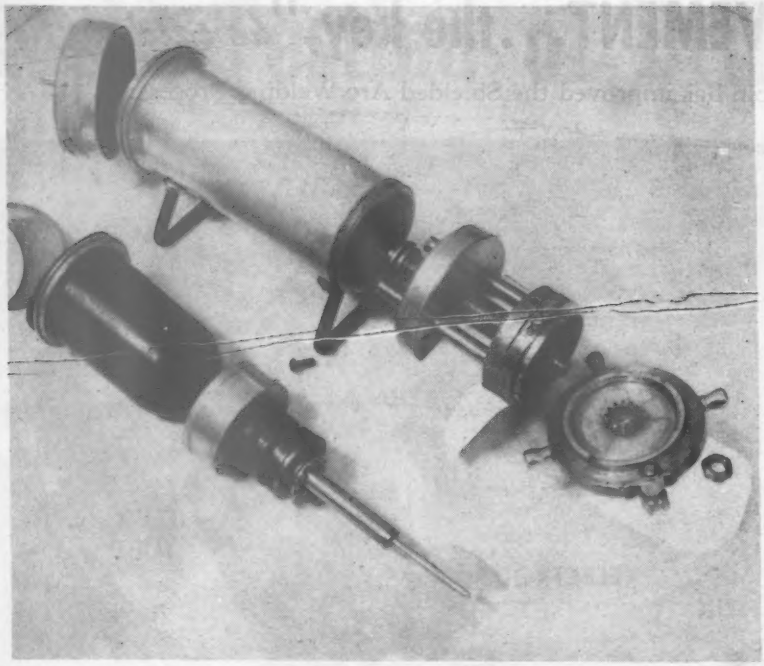


Fig. 2—Filter press built for work on a drilling rig exclusively

Filter Press

Fig. 2 illustrates a filter press built, not in conflict or competition to the air type, but for work on a drilling rig exclusively. It does not offer any particular advantage in a lab, but it has several points of advantage in the field.

1. It is portable—weight about 11 lb., also filtrate vial and filter paper are carried in the machine.
2. The machine is complete in one unit, lacks air bottles, hose, and stand for the pressure cell.
3. Only inside of bag gets muddy during use—easy to clean.
4. Pressure is checked by touch or sight.
5. Operation is fast; although, as with other instruments, some practice is necessary before speed is possible.
6. Few repairs are required to keep in operation.
7. Synthetic rubber bag allows use on oil base or emulsion muds.

Advantages gained were at some cost—namely:

1. To keep the pressure at an average 100 psi. adjust the wheel every 10 to 15 cc. of filtrate. If one allows indicator to extend about $\frac{1}{16}$ in., then recede a like amount, the spread of 110 to 90 lb. will bring out more filtrate.
2. Errors were in the order of 1.9 to 3.7 per cent on the instruments. Newer models may correct this.
3. Capacity: the instrument was not built to squeeze more than 100 cc. out of the pint mud sample. If water loss as large as this is contemplated, operator should change mud engineer or calibrate to compensate for extra compression of rubber wall of bag.
4. Upon filling with mud, care must be taken to prevent spilling.

Fig. 2 shows the disassembled parts. The "mud end" consists of a rubber bag. To fill, press is stood upright. Operating position is horizontal.

The other end is a light weight gear box. The gear change is from direct drive of a 12-thread per inch, 1-in. diameter screw to a 3-to-1 gear ratio on the internal gear, which produces a total pressure of 100 psi. on the filter. The piston engages the bag; and since "accordion" action is not possible, the action is compression of an area of rubber equal to the bag thickness times the circumference. The rubber section is under compression, and compensation is made for it by calibration.

Hydrogen-ion Test

Hydrogen-ion test is, of course, a necessary measurement. Its accuracy is important, and, while use of a Beckman or an equivalent instrument is essential, there is one universal range tape enclosed in the kit for routine checking. The tape is shown in the illustration of the chemical kit. While the error can amount to 1 unit pH, it is a guide to (a) high alkalinity pH; (b) medium high alkalinity pH; (c) neutral pH; (d) medium acid pH, and (e) high acid pH.

For quick check, and if one side is applied directly to mud, the color will show by seepage, on other side.

Sand Test

See discussion under "Sand," and refer to Fig. 3 and 4. This test deserves attention for its speed and accuracy.

Mud (250 cc.) is placed into a liter cup which is filled with water, stirred and, after a minute, separated by decanting. The sand is transferred into a graduated scale hydrometer cup and remaining space filled with water.

Then, using either a nomograph or special slide-rule, the per cent sand by weight or volume is read. There is no thought of confusing the present methods of measuring sand. However, report of sand as a per

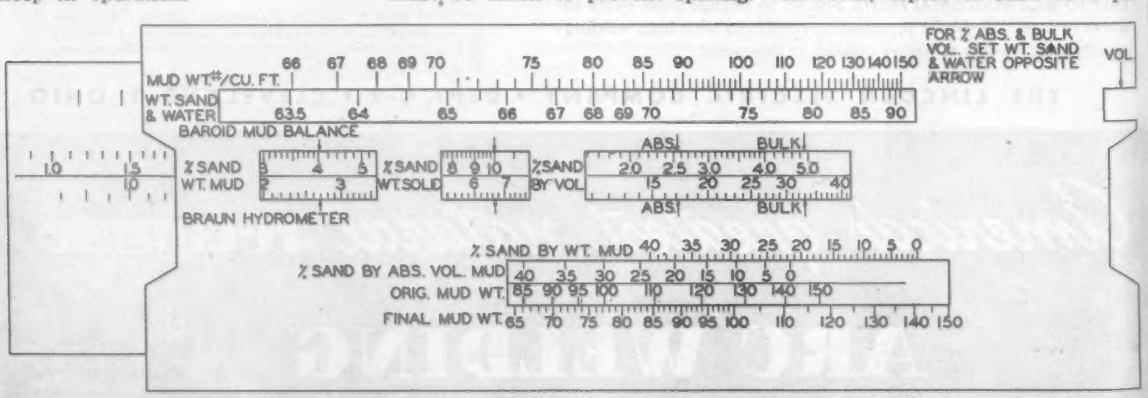

FOR % ABS. & BULK VOL. SET WT. SAND & WATER OPPOSITE ARROW
VOL.
MUD WT.#/CU. FT.
66 67 68 69 70 75 80 85 90 100 110 120 130 140 150
WT. SAND & WATER
63.5 64 65 66 67 68 69 70 75 80 85 90
BAROID MUD BALANCE
ABS.
BULK
% SAND WT. MUD
% SAND WT. SOLID
% SAND BY VOL
BRAUN HYDROMETER
% SAND BY WT. MUD 40 35 30 25 20 15 10 5 0
% SAND BY ABS. VOL. MUD 40 35 30 25 20 15 10 5 0
ORIG. MUD WT. 85 90 95 100 110 120 130 140 150
FINAL MUD WT. 65 70 75 80 85 90 95 100 110 120 130 140 150

Fig. 3—Sand-content slide rule. Arrangement suggested by Delmar Larson, Baroid Sales Division

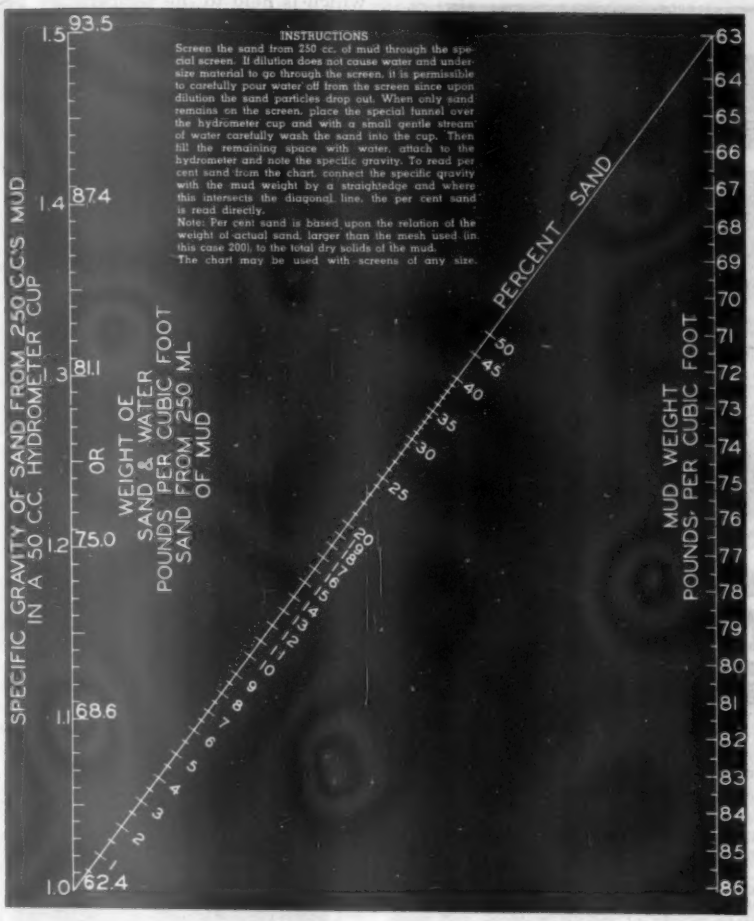

INSTRUCTIONS
Screen the sand from 250 cc. of mud through the special screen. If dilution does not cause water and undersize material to go through the screen, it is permissible to carefully pour water off from the screen since upon dilution the sand particles drop out. When only sand remains on the screen, place the special funnel over the hydrometer cup and with a small gentle stream of water carefully wash the sand into the cup. Then fill the remaining space with water, attach to the hydrometer and note the specific gravity. To read per cent sand from the chart, connect the specific gravity with the mud weight by a straightedge and where this intersects the diagonal line, the per cent sand is read directly.
Note: Per cent sand is based upon the relation of the weight of actual sand, larger than the mesh used (in this case 200), to the total dry solids of the mud.
The chart may be used with screens of any size.
SPECIFIC GRAVITY OF SAND FROM 250 CC'S MUD IN A 50 CC. HYDROMETER CUP
WEIGHT OF SAND & WATER POUNDS PER CUBIC FOOT SAND FROM 250 ML OF MUD
OR
PERCENT SAND
MUD WEIGHT POUNDS PER CUBIC FOOT
1.5 93.5
1.4 87.4
1.3 81.1
1.2 75.0
1.1 68.6
1.0 62.4
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
50 45 40 35 30 25 20 18 16 14 13 12 10 9 8 7 6 5 4 3 2 1

Fig. 4—Alignment chart for determining per cent of sand in mud (weight)

cent of total solids is such as to take account of a low per cent clay. This percentage actually indicates the settling tendency when viscosity is considered. It shows the danger of the sand to the drilling operation.

Automotive Lab. Arrangement

Fig. 5 illustrates an automotive laboratory arrangement. The following are some handy devices: (a) Basic idea on the design is that when turtleback is raised, the instruments are ready to go to work. Saves time unwrapping and unpacking. (b) Electric centrifuge—very handy in various tests. (c) All large instruments are placed on "bread-boards," so that when traveling, they are shoved into their space and are held down. (d) Double "deck" can be opened backward on piano hinge, providing an outboard work table. (e) Hydrometer tube or well is "buried" in the fender opposite the gas cap, and kept full of water ready to use. (f) Door to centrifuge and mixer compartment is equipped to hold a funnel for salt test. (g) A 20-gal. tank, containing air and water, built as an air receiver, is mounted ahead of, and hidden by, the cabinet. The air filter press is supplied from top of tank, the water nozzle takes water from below this air space. Refilling takes only a few minutes. (h) A filter press was rebuilt as seen on photo to have a fixed upper head. The cell fitting into this head was tightened, by means of cams beneath, operated by a 6-in. handle. The filter press was much improved and worked very well. The idea may be interesting to some.

Skeleton Outline of Defective Muds and Their Treatment

1. High temperature muds: Frequent, high fluid-loss; tight hole. Reduce pH, use STP, SHMP, or Que. Also di-cy, negrosin, with step cooler.

2. Excess colloidal material: Characterized by increase of weight, formation bentonite, "gel-happy" personnel. Use heavy mud or $BaSO_4$, reduce pH, use STP, SHMP, or SAPP.

3. Poor mud and colloidal material: Build up with good clay to get weight and regain colloids. Add or sweeten by schedule. Use TSPP usually.

4. Hole contamination: Hole makes poor mud, or shale waste material. Replace with good mud. Use TSPP.

5. Hole sloughing: Sometimes results in tight hole from mud wall; bit can't go to bottom. Increase the weight. Reduce pH. Use STP.

6. Sand: Natural in top hole; 25 per cent OK for surface-casing job; reduce if it runs 15 per cent in ordinary drilling; for liner, keep under 10 per cent. Watch that liner doesn't clog with sand. Test on weight basis safest. Test daily.

7. Excess bottom-hole dewatering: Stops a bit, also electric log and hole survey tests. Use Lig/gel, or Lig/H_2O, at 5 lb. per barrel, and 150 lb. per barrel respectively, to drill in or to run liner. Use TSPP.

8. Lost circulation: If slight, use bark, hulls or gelatin. If bad, use sod, sil/$caCl_2$. May precede with $CaSO_4$ and wool matrix. Use cement wagon. Reduce weight and viscosity. Go slow and pump slow.

OUTLINE OF PROCEDURE ON MUD PROBLEMS

On any mud problem, whether emergency or routine, the following outline of attack may be followed profitably. Simply divide it into three steps, namely:

	1. Symptoms, their examination which allows:	2. Diagnosis and Interpretation to find causes, which suggest:	3. Proper Treatment.
EXAMINE RIG	Visually examine mud-ditch, screen, pit and action of tools. Get crew to talk informally about rig.	The examination should give over-all picture which often can suggest treatment without further testing. Example: Pit loses mud — treat with gel flakes.	Treatment may be all based on physical like use of gel flakes. Also this data will be used with later tests.
PHYSICAL TESTS	Make all necessary physical tests, and log these.	The physical changes in mud often show the exact trouble. Usually this test suggests further testing of chemical aspect.	Treatment is often completely indicated by physical tests (weight, fluid-loss, cake, sand, etc.)
CHEMICAL TESTS	Make all necessary chemical tests and log these.	This is next step by which time a complete picture is obtained to suggest trouble and indicated treatment.	Proper treatment can usually be tied down to specific impurities. Example is Calcium, SO_4, etc. Tests should be complete at this stage.
PERSONAL ASPECT	Note well if personnel is irked or excited.	This condition usually caused by anxiety or fatigue.	One should recognize these problems of personality and handle with understanding and patience.

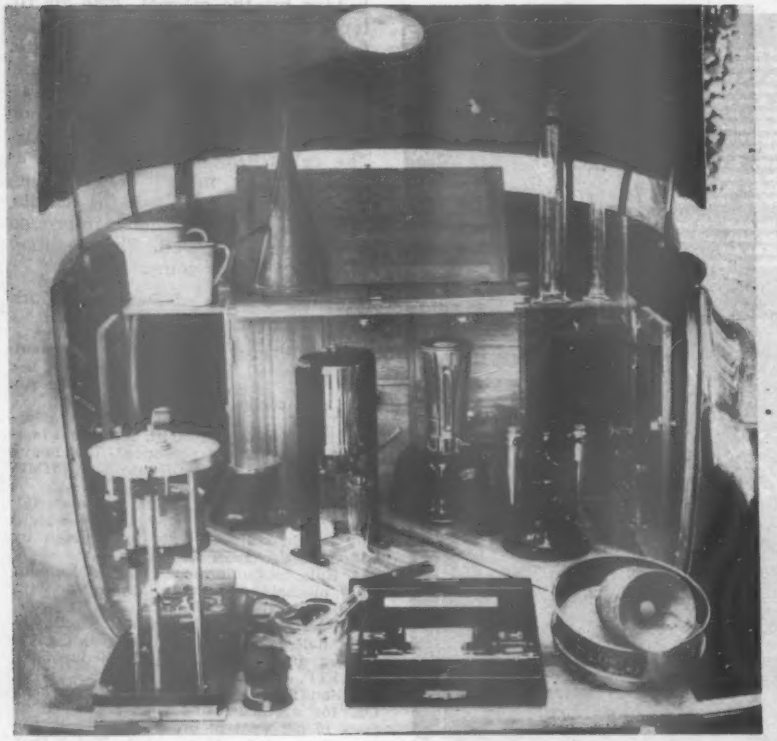


Fig. 5—Automotive laboratory arrangement. When turtle back is raised, the instruments are ready to go to work, saving unwrapping and unpacking

9. Calcium: From cement, gypsum, or saline bent. Treat with oxalic acid and TSPP or SHMP. Oxalic acid not usable when carbonates are present.

10. Magnesium: From saline bent, etc. Treat with $NaBO_2$ and/or TSPP and SHMP.

11. Sulphates: From gypsum, or hole clays. Treat with $BaCO_3$ in excess. Allow 10 hours for reaction. Make change to $BaSO_4$. Supplement with SHMP.

12. Cement-cut mud: If slight, use Que., SAPP or SHMP. If bad, use oxalic acid in absence of carbonates. Use fresh colloid clay and SHMP. Reduce pH.

13. Shale: Prevent by nonhydration; reduce pH; use sufficient weight material; maintain low water-loss. Warnings, if pump slows, pull up; if light, thick mud returns, discard. If severe, use weight material and minimum colloids, plus "N" silicate, plus or minus 15 lb. per barrel.

14. Salt or chlorides: Treat if over 600 g. per gallon. If salt water comes into the hole, build up weight but take care not to lose circulation. Use Irish moss, Que. or SHMP and silicate. Starch mud is good.

15. Gas: Bubbles or gas-cut mud; pit gains; weight build-up indicated. Gas-cut mud after a trip OK. Use a gas trap. Have plenty of weight material and mud on hand.

16. Overtreatment: Too much chemical. Use new clay or weight material. Reduce pH. Reduce viscosity with SHMP or large amounts of protective colloid like Que. at 4 to 5 lb. per barrel.

Acknowledgements

The writer is indebted to the management of the Tide Water Associated Oil Co.; to J. F. Herold, and to D. E. Butler, for help and collaboration.

Bibliography

Donald C. Bond, "Positive Colloid Muds for Drilling Through Heaving Shale," Petroleum Technology 7, No. 1, January, 1944.

Preston E. Cheney, "A Review of Recent Advances in Drilling Mud Control," A.P.I. paper, presented November 10, 1942, Chicago, Ill.

Continuous Viscosimeter Is Automatic

FOR determining the viscosity of the products of a distillation unit in the Tide Water Associated Oil Co. refinery at Bayonne, N. Y., a continuous viscosimeter is mounted as shown in the photograph.

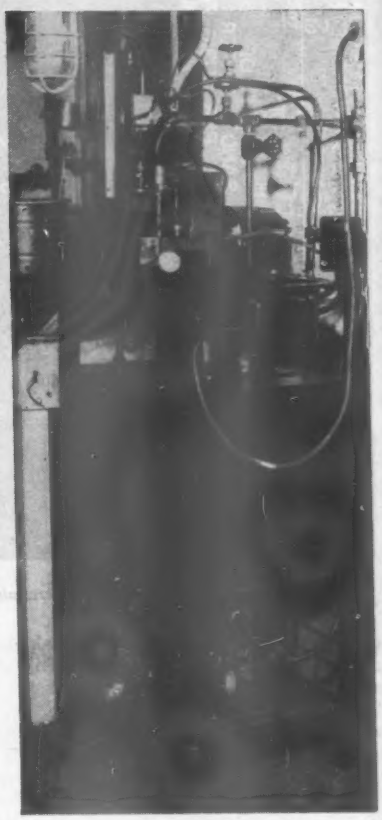
The viscosimeter itself, mounted on top of the stand, is a Miller viscosimeter. In general, this instrument is made up of the main block or a casting, water jacketed for temperature control. Through this block, in a vertical position, is a tapered hole into which is fitted a tapered plug which is rotated at 60 r.p.m. by constant-speed motor and reduction gear.

The oil to be tested flows at a low rate through the small clearance between the plug and the block. The temperature of the whole is maintained at 100° F. or 210° F., as desired, by the water jacket through which a small pump circulates water which is held to the temperature by an electric heater controlled by a thermostat.

The rotating tapered plug produces a pumping action which generates a pressure in the port leading to a single-tube manometer where the oil itself rises to a height directly proportional to this pressure. The height is a direct indicator of viscosity.

Scale Attached to Tube

Readings are taken on the scale, attached to the manometer tube,



graduated in millimeters and calibrated in S.S.U.

The new feature about this whole installation is the mounting for the viscosimeter. It is fitted to top of a steel table into which is built a reservoir for collecting the oil which has passed through the viscosimeter. Below this reservoir is a small motor-driven pump controlled by the mercoid switch located just back of the viscosimeter. This switch is actuated by a float in the reservoir. When the reservoir is full, the switch turns the motor on and the pump delivers the oil from the reservoir to the line going from the unit to storage.

This entire installation is entirely automatic, gives a continuous indicated viscosity and returns the sampled oil to the unit.

been utilized for some time by J. C. Mayfield, drilling contractor, operating as Mayfield Drilling Co., prior to the recent more extensive adoption of this practice. He applies it wherever the topography of the drill site makes it practicable.

Flexible Piping Plan

Piping for mud lines, steam lines, and water lines has been fabricated for his rigs in such a way as to provide for long swings to facilitate more convenient location of equipment according to this plan. Time is saved and effort is conserved in conforming to irregularities of the surface of the ground. Numerous long nipples of 12 ft. to 20 ft. in length are used where it is generally customary at many rigs to use shorter nipples. Consequently, more flexibility is provided for installation at drill sites of differing terrain which necessarily interferes with maintaining uniform measurements between units of equipment. Since piping with long swings will fit almost any drill site, the cutting and fitting of pipe at each location for connections for boiler settings has been practically eliminated under normal conditions of rigging up by this plan. Where it is applied flexibility is regarded as more desirable than a precise lineup of connections.

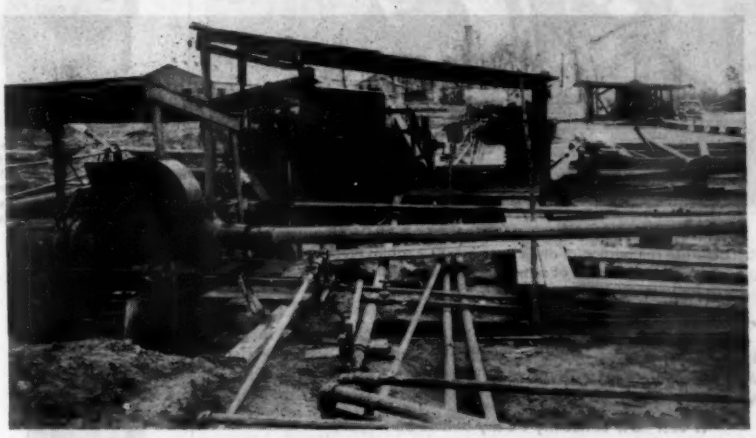
Boilers and pumps can be located within limits either closer or farther from the rig in accordance with conditions of the ground without the need for cutting pipe for connections.

The tool house at such rigs is located on the ground at a greater distance from the derrick than is customary. Near the tool house of each of the rigs of this firm there is a doghouse furnished with double-decked beds for the use of the contractor and geologist during critical periods when it is important for them to remain constantly at the well to be ready when important decisions must be made. Shelter for men at the derrick is furnished by a special doghouse, of lighter construction than standard tool houses. This shelter is installed in an elevated position where it may be entered from the derrick floor. In winter this is heated by a central steam coil; in warm weather it may be ventilated by opening shutters at the side.

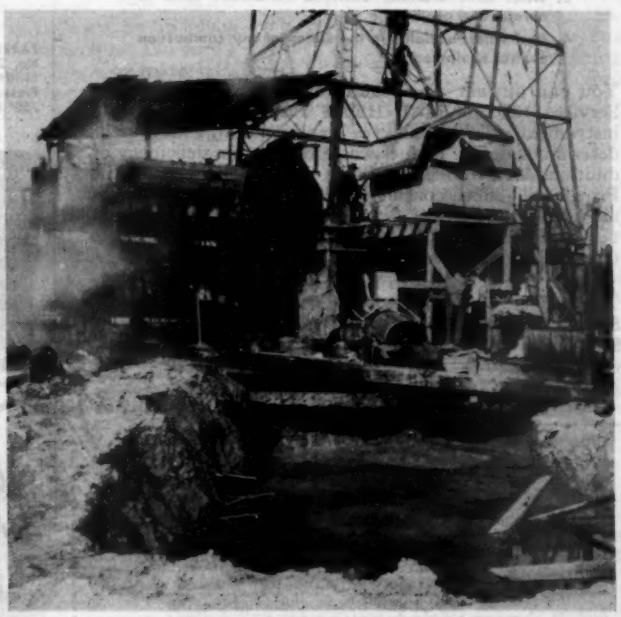
A feature of drilling operations in southern Arkansas in recent months has been the rapidly increasing use of Impermex or starch-type treatment of drilling mud at depths where high water loss while drilling through anhydrite presents serious problems. While a greater use of this type of treatment has been reported throughout the Ark-La-Tex area during this period, its application to southern Arkansas drilling has been the most extensive.

In this area, this treatment begins after drilling the plug of the 9⅝-in. casing set at depths ranging between 2,500 ft. and 4,000 ft., according to the locality. Because of the low water loss of mud resulting from the procedure, it naturally follows that

(Continued on page 133)



(Right and immediately below) Layout of Penrod Drilling Co. with which boilers are at a distance on the V-side of the derrick. Mud pumps and mud-treatment facilities are nearer the derrick close to the V side. (Lower right) Shale shaker at Mayfield rig operating over pit. Light type of shelter for crew at derrick instead of heavy tool house. The tool house is on the ground beyond the derrick



HEAT PROVER

—Quickly reveals Incomplete Combustion

FREE Demonstration Test will help solve your combustion problems... conserve fuel... increase quantity and quality of your product.
CITIES SERVICE

THE CITIES SERVICE INDUSTRIAL HEAT PROVER—a new, accurate combustion analysis instrument—enables those engaged in the oxygen control of furnace atmospheres to achieve greater combustion efficiency at less cost.

Today, like many engineers in both small and large industrial plants, you very likely want to know—*by accurate measurement*—the answer to these four vital problems:

1. **Just how efficiently do my boilers burn fuel?**
2. **How efficiently do wartime operators control them?**
3. **What have wartime overload conditions done to normal fuel economy?**
4. **And what, actually, is the status of my combustion control equipment?**

You can answer all these questions with the Cities Service INDUSTRIAL HEAT PROVER. This unique instrument quickly analyzes combustion . . . accurately determines degree of fuel waste due to air deficiency or dilution. As a result, the Cities Service Industrial Heat Prover will effect considerable savings in fuel costs . . . aid better production . . . and help prevent repairs and replacements of furnace linings, crucibles and refractories due to flame corrosion.

Why not get a Cities Service Industrial Heat Prover Test in your own plant . . . *without cost or obligation?* Simply mail the coupon below. A Cities Service Engineer will call at your convenience.

CITIES SERVICE OILS — ONCE-ALWAYS

(This offer is available only in Cities Service marketing areas EAST of the Rockies.)

Cities Service Oil Company
Room 279
Sixty Wall Tower, New York 5, N. Y.

Gentlemen: Please arrange a Cities Service Industrial Heat Prover Test for my plant. I understand there is no charge or obligation for this service.

Name .....
Title .....
Company .....
Address .....

Paste THIS in your handbook, Mr. Engineer!

IF your pressure line requires a SPECIAL Relief or Safety Valve—Farris engineers can provide the proper valve, or custom build one for you!

FARRIS Handwheel Relief Valve No. 1450, for frequent changes of relief pressures. Special construction to withstand excessive wear of continual adjustment. Sizes ½" to 8".

FARRIS Safety Relief Valve No. 2175. Full nozzle port, hi-lift. Steam Separator Bell. Pressures to 600 lbs. at 750° F. Sizes ¾" to 6".

Write us today about any Safety or Relief Valve Problem confronting you. If you are lucky and do not have a valve headache now, GOOD! But paste this ad in your handbook for future emergencies.

FARRIS engineers have been called in on so many special valve jobs that we often wonder "WHAT NEXT!" Minor pressure technicalities and major valve engineering projects alike — we have built accurate, dependable safety and relief valves for *all* of them. Of course we're proud of that record—we are only human!

And as we designed and built those special FARRIS valves for new industries, new processes, new products . . . we added most of them to our regular line of valves. So today, it's a good bet that among the FARRIS collection of all types, sizes, and metals, there is *the very valve* which will exactly meet your requirements.

But if WE have *any* doubt about that, we will *custom build a valve especially for your job.* And we'll be glad to do it, because we may find that we can add your new FARRIS valve to our already extensive line . . . so we'll mutually benefit from your problem!

Now, don't you agree . . . that makes good business sense? *Why not write today for our Specifications Bulletin?*

FARRIS ENGINEERING CO.
372 Commercial Ave., Palisades Park, N. J.

Farris

SAFETY and RELIEF VALVES

PROGRESS IN METALS

by W. L. Nelson
Consulting Engineer

The Electron Microscope

MAN'S knowledge of just how the particles of a material are hooked together has been greatly expanded by the commercial development of the Radio Corp. of America electron microscope. Ordinarily the highest practical magnification by means of the ordinary or light microscope is about 2,000X, whereas the electron microscope can be used up to magnifications of 30,000X which can be enlarged up to even 100,000X.

Figs. 1 and 2 shown on this page illustrate the great resolving power of such a microscope. Obviously these extreme magnifications mean little to those who have not used the microscope but in time their usefulness will become apparent. The 1μ scales (micron) shown on the figures indicate a length of 0.0001 cm. or about 0.00004 in. The particles of zinc oxide smoke shown in Fig. 1 were collected on a 200-mesh wire screen, the usual specimen support, but the magnification is so large that the wire screen is not visible.

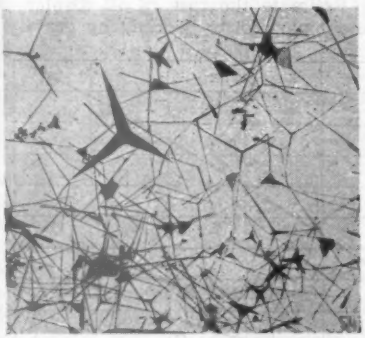


Fig. 1—Zinc oxide magnified 30,000X with the RCA Electron microscope. Crystals produced by burning zinc in air

Fig. 2—Stainless steel at 14,800X. Grain boundaries and "twinning" are clearly demonstrated in this photograph

The penetrating power of electrons is so small that the specimen must have substantially no thickness. This has required the development of "surface replica" techniques by which films of collodian, Formvar, or similar materials are produced on the surface of the material and are then stripped off for examination by the microscope. The stainless steel replica shown in Fig. 2 was obtained in this general manner by what is known as the "silica replica" method.

Obviously great care and a skillful physicist are required to operate the microscope. Two commercial equipments have been developed by R.C.A. since 1940 and according to R. G. Picard and P. C. Smith who presented an excellent paper in the September 1944 issue of Metals & Alloys, a substantial number of installations has been made. The microscope involves the use of a stream of electrons for the illumination of the object, rather than illumination with light. The wave length of such a ray is about one-tenth of that of red light (7,000 Amgstroms), thus permitting magnifications about 10 times greater than that obtainable by light microscopes. The instruments can also be used as an electron diffraction camera for the study of the atomic structure of materials, particularly for the study of surface structures which cannot be studied by X-rays because of the great penetrating power of these rays.

Removing Broken Taps

BROKEN taps are a constant headache in many factories and shops. Sometimes the work must be scrapped, and sometimes the damaged tap is laboriously removed by such costly time-wasting procedures as shipping, drilling, or the use of a screw extractor.

The Eutectic Welder of December introduces a new method of removing broken taps. (Fig. 1.) This unique method might be likened to the mending of pottery by means of a cement or glue, except that the broken part is welded or held together by means of one of the low-melting eutectics developed by Eutectic Welding Alloys, Inc. The broken part is not permanently mended, but the parts are fastened together sufficiently well to permit removal of the tap. The operation is described thus:

"One eastern plant was especially chagrined by the frequent loss of valuable bottoming taps. The usual methods of drilling, chipping and screw-exacting were tried with but occasional success. When the field engineer was called on for advice, he suggested a type of alloy which can be applied with an oxyacetylene

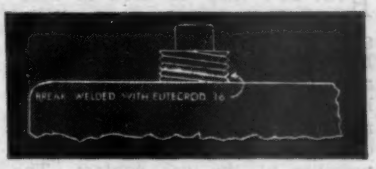


Fig. 1

torch. A special flux was painted on the end of the tap broken in the work and on the loose half. The two surfaces were "tinned" with the alloy and clamped together. The torch was carefully directed at the joint until the molten alloy showed uniformly around the joint. As soon as the alloy solidified, the broken tap was easily withdrawn. This procedure has enabled the plant to save hundreds of dollars' worth of taps and irreplaceable man hours."

"(Editor's Note: EutecRod 16 bonds to steel at 1,300-1,600°F. and has a tensile strength of 160,000 psi. in this type of joint.)"

Trends in Stainless Steel and Iron

DURING the last year the demand for stainless chromium (12-14 per cent Cr) iron and steel increased greatly. Recent data of the American Iron and Steel Institute show an increase of 57.8 per cent in 1943 compared to 1942. This increase amounts to 36,427 tons, making a total for 1943 of 98,997 tons. This is a record production.

Lokewise, "stainless steel ingots" of the chromium-nickel type show an increase of 34.2 per cent in 1943 over 1942 production. The 1943 production was 457,448 tons of these corrosion-and-heat-resisting alloys.

Undoubtedly the petroleum refining industry will continue to use more and more of these alloys, particularly for the replacement of pipe-still tubes that could not be replaced during the war.

Metallurgical Terms

Billet

A billet is a rectangular semifinished rolled ingot of from 4 to 36 sq. in. cross-section, with a width less than twice the thickness.

Displacement of Oil by Gravity Relative to Gas

*by Park J. Jones**

PART 24 OF A SERIES

Displacement of oil by gravity relative to gas takes place in many reservoirs. Equations are derived which may be used to estimate the rate of oil displacement by gravity parallel to bedding in barrels per day per acre. The rate of oil advancement parallel to bedding in feet per day is also considered. Graphs showing the effect of dip, permeability and gas saturation on the rate of oil displacement by gravity are included. The rate of advancement downdip in feet per day of a gas contact varies inversely with gas saturation. The lower the oil recovery the faster the rate of advancement of a gas contact. Time is a factor in displacement of oil by gravity. Because of the time factor, the faster the rate of oil production from a reservoir the lower the oil recovery at a gas contact and the faster the rate of advancement downdip of a gas contact.

Mechanics of Producing Oil, Condensate, and Natural Gas

Displacement Rate Parallel to Bedding

FIG. 24-1 may be used to illustrate displacement of oil by gravity. A head y feet of reservoir liquid displaces oil downdip toward a well located near a water contact but not into the well. The pressure required to converge and displace oil into the well is supplied by the pressure at the gas contact. The pressure difference for displacing oil downdip parallel to bedding is defined by:

$$\Delta P = 0.433ys = 0.433(sx)\sin D \quad (1)$$

where

D = dip in degrees

s = specific gravity of reservoir liquid

Let h be the pay thickness of a reservoir, then the area at right angles to the direction of dip per foot width along the strike is given by:

$$A = h \cos D \quad (2)$$

Substitution of Equations 1 and 2 in Darcy's law for linear displacement of liquids:

$$Q = \frac{1.127\ KA\ \Delta P}{\mu bL} \quad (3)$$

gives:

$$\frac{Q_s}{w} = 0.488\ \frac{Skh}{\mu b}\sin D \cos D \quad (4)$$

where

h = pay thickness, feet

k = effective permeability, darcys

μ = viscosity of reservoir liquid, centipoises

b = volume factor, bbl. of space per bbl. of oil

The factor Q_s/w in Equation 4 is the rate of oil displacement by gravity in barrels per day per foot width along a strike. The displacement is parallel to bedding. Other things equal, the rate of oil displacement downdip varies with the specific gravity of a reservoir liquid, the effective permeability to a reservoir liquid, the dip, and the pay thickness. But the rate of oil movement downdip varies inversely with the viscosity and the volume factor of a reservoir liquid. An application of Equation 4 will now be illustrated by an example.

*Production consultant, Houston.

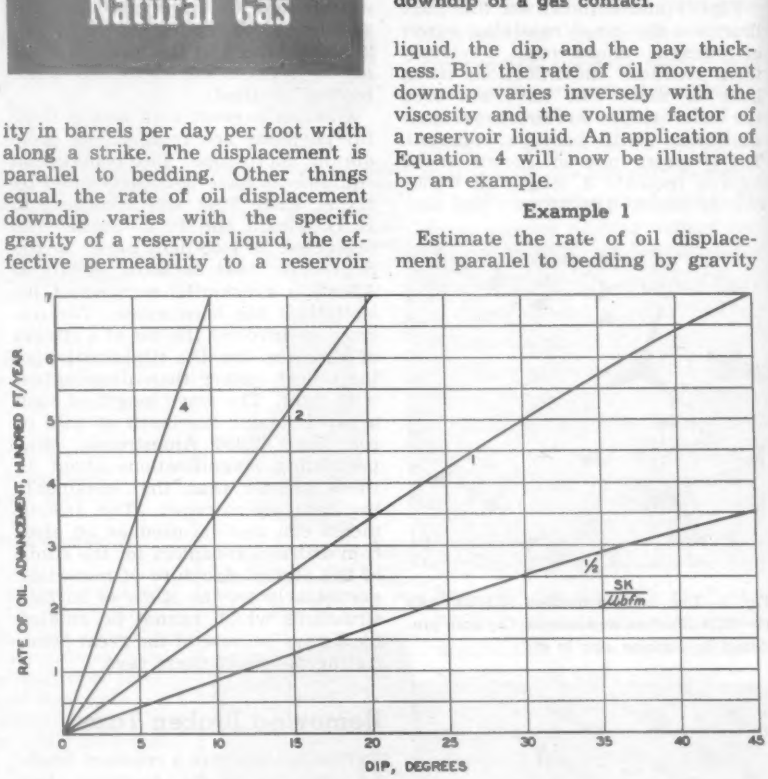


Fig. 24-2—Rate of oil advancement by gravity in feet per year vs. dip of pay; advancement is parallel to bedding

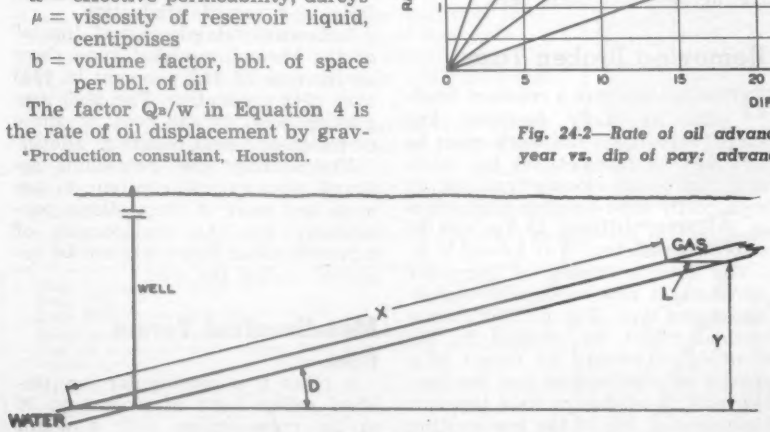


Fig. 24-1—Illustrating displacement of oil by gravity

Example 1

Estimate the rate of oil displacement parallel to bedding by gravity under the following conditions:

Pay thickness = 50 ft.

Dip of pay = 200 ft. per 1,000 ft. = 11° and 32 min.

Specific gravity of reservoir liquid = 0.76

Volume factor = 1.2 bbl./bbl.

Effective permeability = 400 md.

Sin D = 0.2; cos D = 0.98

Viscosity = 2.0 centipoises

In this example the rate of oil

(Continued on page 134)

Automatic Distillation Unit Shows Exceptional Efficiency

Designed for automatic operation, the fractionating unit described here may be operated continuously over long periods. Automatic collection of distillate samples and the recording of reflux temperatures for each 2½ ml. increment is one of the outstanding features of the apparatus. Provision for safety is carried out by means of control circuit interlocking.

REQUIRING little attention except for a few routine chores that may be carried out at the end of the ordinary work day, an automatic fractionating column, one of six units in continuous use in the General Motors Research Laboratory, shows performances as high as 120 theoretical plates. Except for the once-a-day chores the column, normally, may be operated continuously over periods of several weeks without other attention.

Designed so that various types of packing may be used as desired, the apparatus provides broad operational flexibility. For analytical purposes special packing, a continuous helix extending the full height of the column, is used. Efficiency, at total reflux, determined in the usual manner using an n-heptane-methylcyclohexane test mixture, is illustrated in Fig. 1. Dynamic holdup, determined with n-heptane and stearic acid, is given as running between 35 and 40 ml. Throughput rates are shown to be around 8 ml. or more of liquid per minute for usual operations. Without correction for static holdup distillation losses for continuous operation over several weeks are indicated to be between 1 and 2 per cent. Separation of fractions having boiling differences as close as 4.2° F. is successfully carried out with the special helical packing. The distillation curves, Figs. 2 and 3, illustrate typical performances.

Distillate samples, automatically collected in small bottles, may be varied from 2½ to 12½ ml. by 2½-ml. increments as desired. Sample volume takeoff is maintained after the desired quantity is established by setting a selector switch manually. The mechanism that supplies the sample containers holds a charge of 60 bottles, all of which after receiving samples, are manually removed and manually replaced with "empties." The apparatus for handling the bottles having its control system interlocked with the distillate takeoff mechanism control and the volume selector, is made safe against mixing or loss of samples.

The distillate-takeoff control system is designed to function without regard to time, when a fixed amount of distillate has passed into a receiver. This part of the control circuit employs a phototube which, when "fired" by the interruption of a light beam, actuates a solenoid unloading valve, the volume selector in the bottle-changer control circuit and an auxiliary pen for recording the reflux temperature on the strip chart at a five-range recorder. The receiver, positioned between the phototube and the light source, is equipped with a solenoid-operated valve at its lower end, and a float which when a predetermined volume has entered the receiver, interrupts the light beam. Focusing the light beam on the phototube is carried out with a blackened shield in which a narrow slit has been cut. The shield, attached to the receiver, is adjustable for aligning the light beam and the float.

Reflux temperatures, recorded to 0.1° C. by a Leeds & Northrup Micromax potentiometer constructed for maximum sensitivity with a 10-

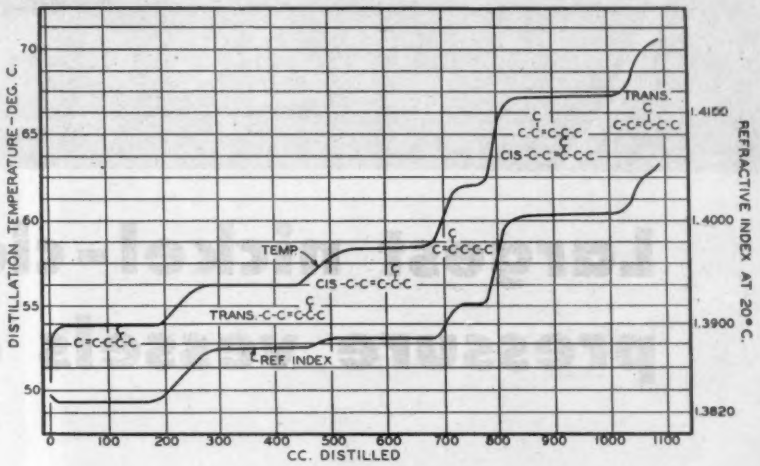


Fig. 2

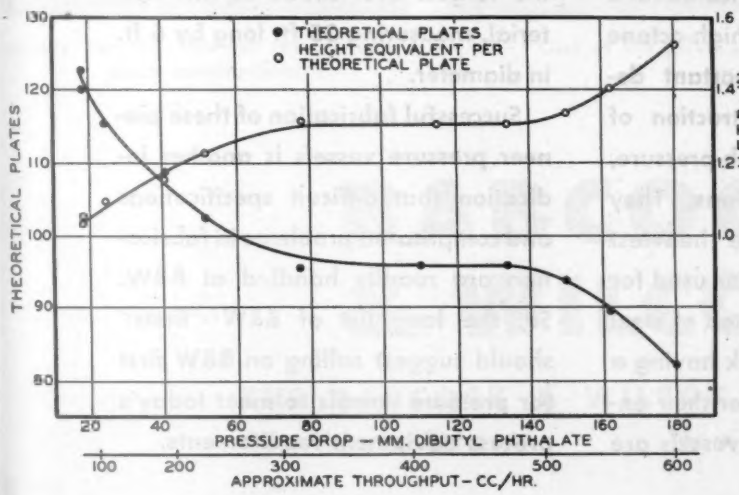


Fig. 1

Largest nickel-clad pressure vessels ever built

Four reactors recently fabricated for a large refinery producing high-octane gasoline introduced important developments in the construction of process equipment for high-pressure, high-temperature conditions. They were constructed of the heaviest nickel-clad steel plates ever used for this purpose. These consisted of steel plates 3 11/32 inches thick having a ⅜-inch nickel cladding over their entire interior surfaces. The vessels are the largest ever made of this material, measuring 35 ft. long by 6 ft. in diameter.

Successful fabrication of these pioneer pressure vessels is another indication that difficult specifications and complicated problems in fabrication are readily handled at B&W. So, the long list of B&W "firsts" should suggest calling on B&W first for pressure vessels to meet today's process equipment requirements.

End view of reactor under construction showing nickel lining. Nickel butt straps were applied over all welds.

All outside connections on the reactors were lined with nickel, requiring special construction and fabrication.

Heads for the reactors are of one-piece construction.

One of the nickel-clad reactors ready for shipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX COMPANY

85 Liberty Street New York 6, N. Y.

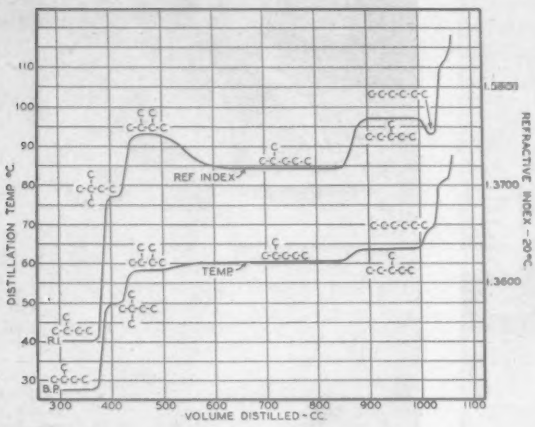


Fig. 3

in. scale range of 5 mv., are measured at the reflux overflow ring in the condenser. Triple junction, 28 B.&S. gage wire, copper-constantan thermocouples with the cold junction in ice are used with a special fitting which passes through the walls of the condenser and water jacket. Made of Kovar* with glass seals for the tubes the special fitting for the thermocouple leads is shown in Fig. 4. The main body of the fitting is made to standard compression fitting dimensions. Soft solder is used to seal the thermocouple leads passing through the small Kovar tubes in the head of the fitting. An automatic range-changing mechanism for the potentiometer provides five overlapping ranges of minus 1 to 4, 3 to 8, 7 to 12, 11 to 16, and 15 to 20 mv. which covers the usual distillation temperature range of 20° to 150° C. The diagram of the circuit for automatically changing temperature recording ranges is shown in Fig. 5. Actuated by contacts on the recorder slide wire, a stepping relay changes loading coils in the potentiometer circuit as the temperature increases or decreases beyond a particular scale range. In order to avoid the possibility of the potentiometer automatically standardizing instantaneously with a range increase and to make the range-changing mechanism universal, a time-delay relay is incorporated in the advancing circuit. A 30-second delay between any two successive range advances is introduced by the relay.

Heat input to the unit is regulated by the pressure in the still, but because the column is operated by atmospheric pressures heat input is considered to be regulated by the pressure drop across the column. This is accomplished with an inclined mercury manometer which serves as a switch in the control circuit. Provided with two inclined legs, one for the control circuit and one for a safety disconnect circuit, the manometer is connected into the still head. The manometer operates as a switch in the control circuit when pressures in the still cause the mercury to rise to a predetermined point in the upper leg where contact is made with the other side of the control circuit. With further rise, contact is made in the second leg causing the heater circuit to be disconnected and so remain until the heater is manually restarted. Actuation of an electronic switch by the manometer-control circuit, places a resistor in series with the heater

*A special glass-sealing alloy.

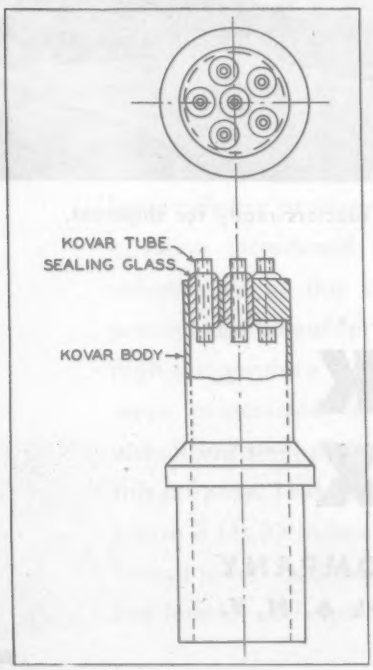


Fig. 4—Special fitting for thermocouple

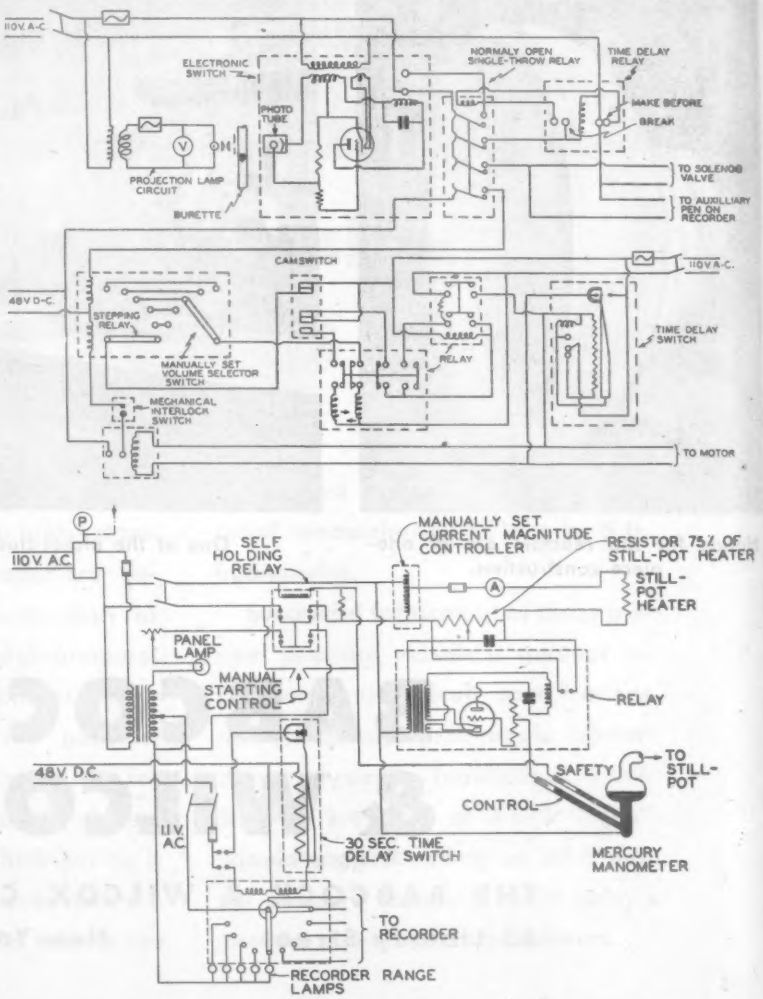


Fig. 5—Diagram of circuits for the column's automatic operation

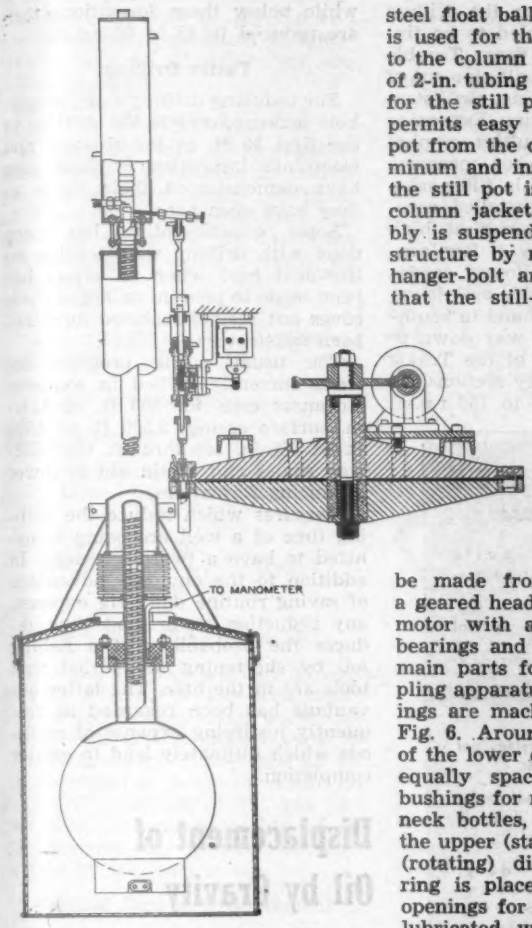


Fig. 6—Cutaway and sectional views of structural details

element; the resistor is rated at about 75 per cent of the heater. With good reflux, this arrangement of control permits about 20° C. rise in distillation temperature. By means of a manually set regulator, current magnitude to the heater is maintained at desired values. Incorporated into the heater control circuit as a safety measure, a low water-pressure switch is arranged to cut off the current supply when water pressure in the condenser has reached a predetermined value.

Stainless steel or Monel is used for the construction of the still pot, the column and jacket and the condenser water jacket. The column is made of 1-in. diameter by 10.5-ft. long polished tubing and the jacket of 3-in. polished tubing. Assembled with silver-soldered joints, the jacket is placed around the column to form a vacuum insulating space. At the upper end of the assembly a thin plate seals the annular space between the column and jacket; a cylindrical bellows with a thin closing plate makes a tight and flexible seal at the lower end of the column and its jacket. A stainless steel float ball, 7 to 9-in. diameter, is used for the still pot. Attached to the column and to a short length of 2-in. tubing which forms the neck for the still pot, a recessed flange permits easy removal of the still pot from the column. Made of aluminum and insulated, a housing for the still pot is supported from the column jacket. The column assembly is suspended from the building structure by means of a yoke and hanger-bolt arrangement. In order that the still-pot housing may be readily removed, its bottom is held between 16 and 18 in. above the floor. Structural details of the column, condenser and the apparatus for removing samples are illustrated in Fig. 6.

Two aluminum castings which may be made from the same pattern, a geared head motor or an ordinary motor with a worm and gear and bearings and shafting comprise the main parts for the automatic sampling apparatus. The aluminum castings are machined as illustrated in Fig. 6. Around the face of the rim of the lower cast-aluminum disk, 60 equally spaced holes into which bushings for receiving the threaded-neck bottles, are inserted. Between the upper (stationary) and the lower (rotating) disk, a bronze bearing ring is placed on center with the openings for the bottles. This ring, lubricated with graphite, forms a sealed bearing. Equally spaced in relationship to the bottle openings, depressions for a cam-actuated switch are machined into the rotating disk's outer rim. This switch functions to position each bottle below the stationary filling tube.

Incorporated into the control circuit for the bottle changer, a time delay allows 90 seconds for emptying of the receiver after the solenoid valve is opened. Other features in this part of the control circuit are shown in Fig. 5.

Editor's note: This article is condensed from an article entitled "Automatic Laboratory Fractionating Column," which appeared in the January 19, 1945, analytical edition of Industrial and Engineering Chemistry.

Modifications Improve Drilling Efficiency

(Continued from page 121)

requirements for adding water are much reduced. And there is less need for jetting of the pits. Sloughing and caving have been so much reduced that cuttings do not come to the surface in excessive amounts. Cuttings now come more directly from the bottom. Viscosity of the mud is maintained low enough so that solids readily drop out. Because of the reduced amount of cuttings in the mud, pump parts are reported to last twice as long. Less settling time is required and there is less need for large pits for settling to protect the pumps and prepare for a loss of mud in emergency situations. Therefore, mud pits are shorter and narrower than formerly. In fact, at some rigs they have been reduced to a third the size of those previously used. Furthermore, for the most efficient handling of Impermex mud, it is actually preferable to have smaller pits.

Reduced Pump Wear

Because of the wearing effect of hard, coarse Cotton Valley sand, one company, operating in southern Arkansas, found that a set of mud-pump pistons had lasted 72 hours. With the use of this type of mud the sand settled readily, was jetted out of the pits and the pistons continued in service to the end of operations at the well.

Before starting such a treatment, the pH is raised to 11.2 or above by adding caustic and a correct gel strength is attained which may or may not call for the addition of bentonite. Impermex is then added slowly to lower the water loss to 2 or 3 cc. Water loss as low as 1 cc. has been obtained in the course of drilling and it is seldom over 6 cc. Usually it is necessary to add 50 lb. of caustic every 6 hours to maintain pH of 11.2. If pH drops below 11.2 the mud will sour within 2 or 3 days and be ruined. Viscosity is controlled by adding quebracho. With this treatment mud is maintained at a weight of 10.2 lb. with 34-seconds viscosity by A.P.I. test of 1,500 cc. in and 1,000 cc. out with a Marsh viscosimeter. Addition of bentonite and weighting materials is required for maintaining these specifications.

With the use of mud treated in this way, heavier weight can be carried in the hole; shales are prevented from caving; high-pressure gas is held back, and good drilling conditions are maintained.

Filter cakes were formerly considered good in southern Arkansas if they had a thickness of 6/32 in. With Impermex, the filter cakes have been reduced to 1/64 in. With thinner filter cakes, down time is reduced and there is less risk of sticking the drill pipe. One operator reports that drill pipe is handled as freely as though the hole had casing in it instead of mud. Experience of some operators indicates that with the mud treatment now being used the expense for fishing jobs

will be a fraction of what it had been previously.

In the running of an electric log through mud treated by this method, in the Cotton Valley sands, adjustment is made to use a 20-ohm. scale instead of the 50-ohm. scale which has been customary.

Within the last year there has been a general policy among oil companies of paying for all mud materials used by contractors. Formerly, policies differed between companies of paying for either all, part of, or none of the mud used by contractors.

In the past year, before adoption of the improved method, a surprisingly large number of serious fishing jobs occurred when the drilling of a well was scheduled to be finished within a few days. Trouble came during pulling drill pipe out of the hole prior to coring, drill-stem testing or electric logging. Expensive stuck-drill-pipe difficulties emphasized the importance of measures for operating with a thin filter cake.

Auxiliary engines installed especially for driving rotaries at high speeds are utilized by a few contractors in the area. Rotary speeds employed by Mayfield are lower than those generally found in southern Arkansas. On the way down to the sandy formations of the Travis Peak and Cotton Valley sections his rotary speeds are 125 to 150 r.p.m. while below these formations they are reduced to 45 to 60 r.p.m.

Faster Drilling

For reducing drilling time, mousehole makeup, care in the drilling of the first 30 ft. at the surface, and electronic inspection of drill pipe have demonstrated their value as they have elsewhere.

Some experimenting has been done with drilling with tension on the drill pipe when an effort has been made to prevent enlarged shale caves but results reported have not been satisfactory.

The usual casing program for wells currently drilled in southern Arkansas calls for 200 ft. of 13⅜-in. surface casing; 2,500 ft. to 4,000 ft. of 9⅝-in. set through the Midway shales and 5½-in. set to lower producing formations.

Measures which reduce the drilling time of a well are being recognized to have a twofold benefit. In addition to the obvious advantage of saving routine daily rig expense, any reduction in drilling time reduces the probability of a fishing job by shortening the period that tools are in the hole. The latter advantage has been regarded as frequently justifying expense of methods which ultimately lead to earlier completion.

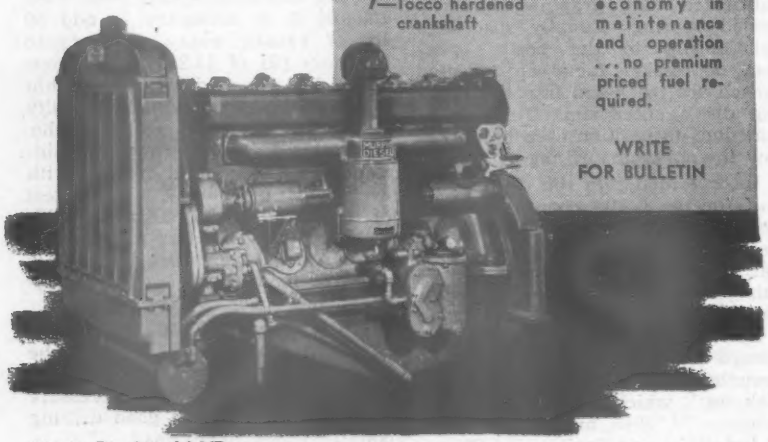
PROVEN IN THE FIELD!

MURPHY DIESELS are made as engines, power units, enclosed power units . . . equipped, as specified, with clutches or outboard bearings, and available with either radiator or heat exchanger cooling. All are engineered to highest efficiency standards, to assure more power, more profit to users . . . as evidenced by these outstanding features:

MURPHY DIESEL
Outstanding Features:

1—MURPHY UNIT INJECTOR
2—24-volt electric starting
3—Ample filters for lubricating and fuel oils
4—Plain open combustion chamber
5—Copper-lead-alloy, steel-backed precision bearing shells
6—Through steel tie-bolts
7—Tocco hardened crankshaft
8—Hydraulic Servo-type governor
9—Safety control
10—Oil cooler
11—Oil cooled pistons
12—Four valves per cylinder
13—Compact, relatively light in weight
14—Heavy-duty, rugged construction, for economy in maintenance and operation . . . no premium priced fuel required.

WRITE FOR BULLETIN



Murphy Diesel Model ME-66, 150 HP continuous, 24-hour duty, full Diesel engine.

☆ *Buy U. S. War Bonds*

MURPHY DIESEL COMPANY
5305 W. Burnham St., Milwaukee 14, Wis.

More Power MURPHY DIESEL *More Profit*

Engines: FROM 90 to 215 HP
Generators: FROM 60 to 115 KW

"FIELD-PROVEN *Power*"

203A

Displacement of Oil by Gravity

(Continued from page 124)

displacement by gravity parallel to bedding per foot width along the strike is given by:

$$\frac{Q_n}{w} = 0.488 \times \frac{0.76 \times 0.4 \times 50}{2 \times 1.2} (0.2)\ (0.98)$$

$$= 0.61 \text{ bbl./day}$$

Displacement Rate Per Acre

The horizontal distance L, see Fig. 24-1, in a section at right angles to a strike is defined by:

$$L = \frac{h \cos D}{\sin D} \qquad (5)$$

where h is the pay thickness and D the dip in degrees.

The rate of oil displacement by gravity in barrels per day per acre parallel to bedding is obtained if we multiply the right side of Equation 4 by 43,560 sinD/cosD and the left side by 1/L. Accordingly:

$$\frac{Q_n}{LW} = 21{,}250 \frac{sk}{\mu b} \sin^2 D \qquad (6)$$

The value of L in Equation 6 is defined by Equation 5. Other things

equal, the per-acre rate of oil displacement depends on the dip and pay thickness. Application of Equation 6 may be illustrated by the following example:

Example 2

Estimate the rate of oil displacement parallel to bedding in barrels per day per acre for the conditions of Example 1; also the total displacement in barrels per day if the width along the strike is 890 ft. By Equation 6:

$$\frac{Q_B}{LW} = 21{,}250\,\frac{76 \times 0.4}{2 \times 1.2}\,(0.04)$$

$$= 108 \text{ bbl./day/acre}$$

By Equation 5:

$$L = \frac{50 \times 0.98}{0.2} = 245 \text{ ft.}$$

$$LW = \frac{245 \times 890}{43{,}560} = 5 \text{ acres}$$

and

$$Q_B = 108 \times 5 = 540 \text{ bbl./day}$$

This rate of displacement is relative to 5 acres. If the area intercepted by the pay in a horizontal plane were greater than 5 acres at some higher level, the rate of oil displacement at this level would be only 5/6 × 108 or 90 bbl. per day per acre. The per-acre rate of oil displacement by gravity is controlled by the least area.

Vertical Rate of Displacement

The vertical rate of fall of oil in barrels per day per foot length of strike is obtained by multiplying Equation 4 by the sine of the dip.

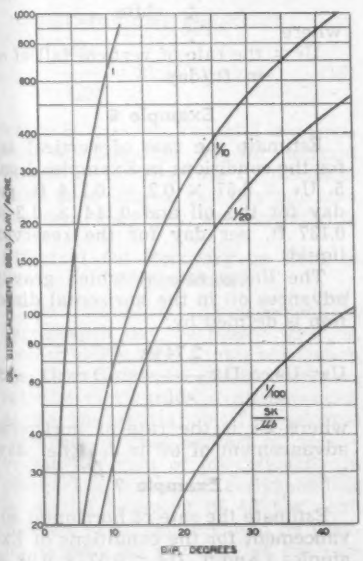


Fig. 24-3—Displacement of oil by gravity parallel to bedding in barrels per day per acre intercepted by pay vs. dip of pay

$$\frac{Q_v}{w} = 0.488\,\frac{skh}{\mu b}\sin^2 D \cos D \quad (7)$$

The vertical rate of fall of oil in barrels per day per acre is obtained by multiplying Equation 6 by the sine of the dip.

$$\frac{Q_v}{LW} = 21{,}250\,\frac{sk}{\mu b}\sin^2 D \quad (8)$$

Example 3

Estimate the vertical rates of fall for the conditions of Examples 1 and 2.

$Q_v/w = 0.61 \times 0.2 = 0.122$ bbl./day/foot length of strike

$Q_v/LW = 108 \times 0.2 = 21.6$ bbl./day/acre intercepted by the pay

Horizontal Rate of Displacement

The horizontal rate of displacement of oil in barrels per day per foot length of strike is defined by:

$$\frac{Q_B}{w} = 0.488\,\frac{skh}{\mu b}\sin D \cos^2 D \quad (9)$$

The horizontal rate of displacement of oil in barrels per day per acre is defined by:

$$\frac{Q_B}{LW} = 21{,}250\,\frac{sk}{\mu b}\sin^2 D \cos D \quad (10)$$

Submit your Special "STEEL STRUCTURES" Problems to us

Stacey Brothers' long experience and established policy of constant research has produced results in design, production, and field erection techniques that have definitely established their leadership in the fabrication of steel and its alloys. You profit from this policy thru more efficient designs, worthwhile weight reductions, and more stable structures with longer life.

You can entrust your requirements for gas storage holders, storage tanks and bins, stand pipes, towers, and similar structures to Stacey Brothers with full assurance of satisfaction in both service and product.

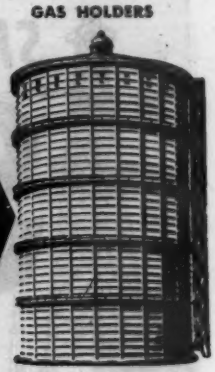
If you are working up plans now for such equipment, our experience and recommendations may be of valuable help to you. Write us now — no obligation.

The STACEY BROS. GAS CONSTRUCTION CO.

One of the Dresser Industries

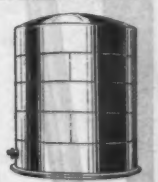
5535 Vine St. Cincinnati 16, Ohio

GAS HOLDERS



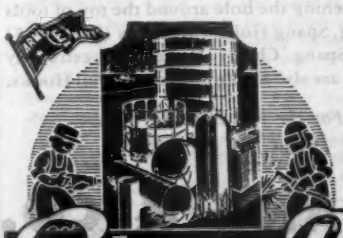
HI-PRESSURE TANKS

STORAGE TANKS



TOWERS AND SCRUBBERS

WELDED FITTINGS



Stacey Brothers ENGINEERS • FABRICATORS ERECTORS • RECOGNIZED EXPERIENCE & FACILITIES

Example 4

Estimate the horizontal displacements for the conditions in Examples 1 and 2.

$Q_B/w = 0.61 \times 0.98 = 0.597$ bbl./day/ft. length of strike

$Q_B/LW = 108 \times 0.98 = 106$ bbl./day/acre intercepted by the pay

Linear Advancement Parallel to Bedding

The linear rate of advancement in feet per day parallel to bedding is defined by:

$$U_B = \frac{5.615\,Q_B}{mfh\,\cos D} = \frac{2.74\,sk}{\mu bfm}\sin D \quad (11)$$

where

Q_B = the rate of oil displacement, bbl./day/ft. length along strike

f = porosity, fraction

m = fraction of porosity occupied by the moving reservoir liquid

U_B = linear rate of advancement parallel to bedding, ft./day

Other things equal, advancement of oil by gravity in feet per day parallel to bedding is controlled by the dip.

Example 5

Estimate the rate of reservoir liquid advancement for the conditions of Example 1 if the porosity is 20 per cent and reservoir liquid is moving in 61 per cent of the porosity:

$$U_B = \frac{5.615 \times 0.61}{0.61 \times 0.2 \times 50 \times 0.98} = 0.57 \text{ ft./day}$$

The rate of advancement for the reservoir liquid is 0.57×1.2 or 0.685 ft. per day. The rate of the gas cap advancement is greater than 0.685 ft. per day if the gas saturation below the original contact is less than 61 per cent of porosity.

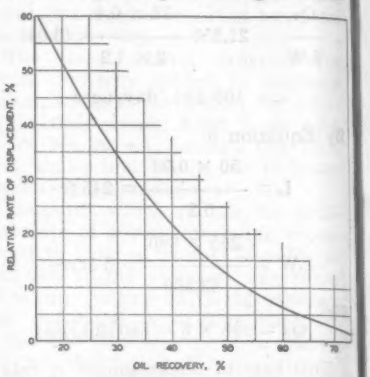


Fig. 24-4—Relative rate of oil displacement by gravity vs. per cent recovery of the oil initially in place; data are based on relative permeability to reservoir liquid and saturation

Linear Rate of Vertical Advancement

The linear rate at which gravity pulls oil vertically is defined by:

$$U_V = U_B \sin D = \frac{2.74\,sk}{\mu bfm}\sin^2 D \quad (12)$$

where

U_V = the rate of vertical fall of oil in ft./day

Example 6

Estimate the rate of vertical fall for the conditions in Examples 1 and 5. $U_V = 0.57 \times 0.2 = 0.114$ ft. per day for the oil and 0.114×1.2 or 0.137 ft. per day for the reservoir liquid.

The linear rate at which gravity advances oil in the horizontal direction is defined by:

$$U_H = U_B \cos D = \frac{2.74\,sk}{\mu bfm}\sin D \cos D \quad (13)$$

where U_H is the rate of horizontal advancement of oil in feet per day.

Example 7

Estimate the rate of horizontal advancement for the conditions of Examples 1 and 5. $U_H = 0.57 \times 0.98 = 0.558$ ft. per day for the oil and 0.558×1.2 or 0.67 ft. per day for the reservoir liquid.

FOR THE BEST IN CABLE TOOLS

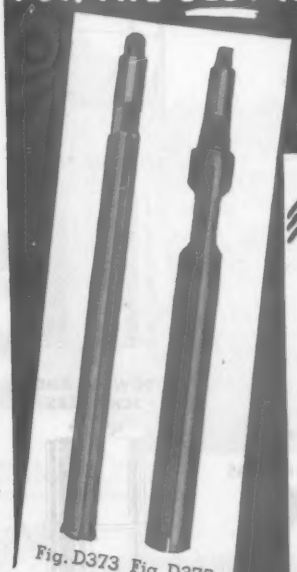


Fig. D373 Fig. D375

SPANG STAR REAMER
(Fig. D373)

SPANG HOLLOW REAMER
(Fig. D375)

For reaming tight holes, or straightening crooked holes, Spang Star Reamers (Fig. D373) or the Spang Solid Reamer (not illustrated) prove extremely useful. They may be supplied either with straight water courses and blades, or made twisted (Spiral).

For opening the hole around the top of tools or tubing, Spang Hollow Reamers (Fig. D375) or the Spang Cherry Picker are extremely useful, as are also Spang Spuds and Wall Hooks.

For the best in Cable Tools
SPECIFY SPANG

THE HIGHER STANDARD

SPANG & CO.
BUTLER, PA.

YOUR DEALER SELLS SPANG TOOLS

Effect of Dip on Linear Advancement

Equation 11 may be written:

$$U_B = 1{,}000 \frac{sk}{\mu bfm} \sin D \qquad (14)$$

where U_B is now the linear rate of

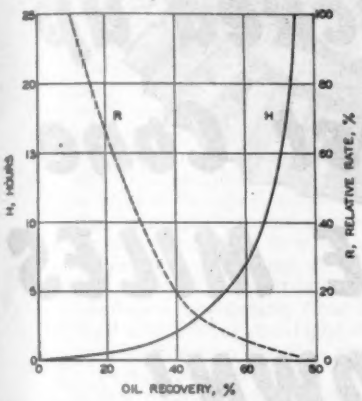


Fig. 24-5—Experimental data on oil recovery and relative rate of recovery of a 38.2° A.P.I. oil at 130° F. from unconsolidated sand. After Stahl, Martin, and Huntington

advancement of oil parallel to bedding in feet per year. Let

$$A = \frac{sk}{\mu bfm}$$

then

$$U_B = 1{,}000\ A \sin D \qquad (15)$$

Fig. 24-2 is a solution of Equation 15 for several values of A.

Effect of Dip on Rate of Displacement

Equation 6 may be written:

$$\frac{Q_B}{LW} = 21{,}250\ B \sin^2 D \qquad (16)$$

where $B = sk/\mu b$. Fig. 24-3 is a solution of Equation 16 for several values of B. The rate of displacement is in barrels per day per acre intercepted by pay, see Equation 5.

Effect of Oil Recovery on Rate of Displacement

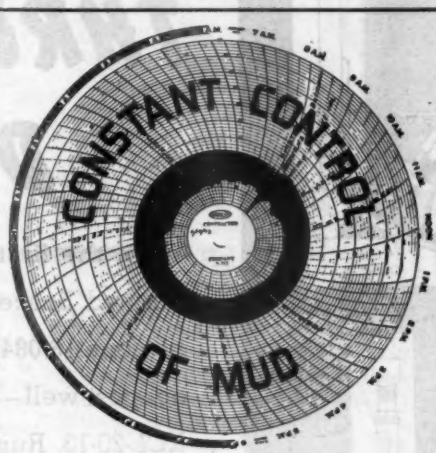
The rate of oil displacement in barrels per day decreases with oil recovery. Fig. 24-4 shows how much the rate of displacement decreases relative to the rate of displacement at no gas saturation. The relative rates are plotted against oil recovery in per cent of oil originally in place. For example, corresponding to an oil recovery of 40 per cent, the rate of oil displacement by gravity is only 22 per cent of the rate of displacement at zero gas saturation. The curve is based on relative permeability to reservoir liquid and gas saturation. It does not include the effect of updip movement of gas.

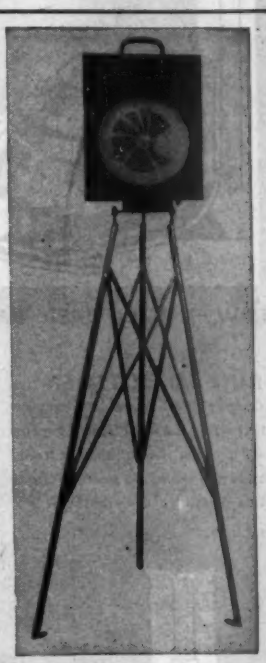
Some experimental data on oil recovery, and relative rate of oil recovery, by gravity is shown in Fig. 24-5. The values are average data for an 8-ft. column of unconsolidated sand. The permeability of the sand was 7.5 darcys. These experimental rates on oil displacement by gravity are slightly higher than the rates given by the equations in this article at low to medium gas saturations and slightly lower corresponding to high gas saturations.

Summing up, displacement by gravity in reservoirs is significant at low to moderate gas saturations. At gas saturations on the order of 40 per cent and higher, displacement by gravity is slowed up considerably. The rate of advancement of a gas contact in feet per day parallel to bedding is inversely proportional to gas saturation. The lower the oil recovery the faster the rate of gas contact advancement. Because of the time factor in the displacement of oil by gravity, the rate of gas contact advancement downdip is proportional to the oil-producing rate from a reservoir.

References

1. Lewis, J. O., A.I.M.E., TP No. 1611.
2. Muskat, M., Flow of Homogeneous Fluids, McGraw-Hill Book Co.
3. Stahl, Martin and Huntington, A.I.M.E., TP No. 1548.





"Mud-O-Graf" offers BLOWOUT PROTECTION

Recording Unit

A Major Oil Company Engineer Says:

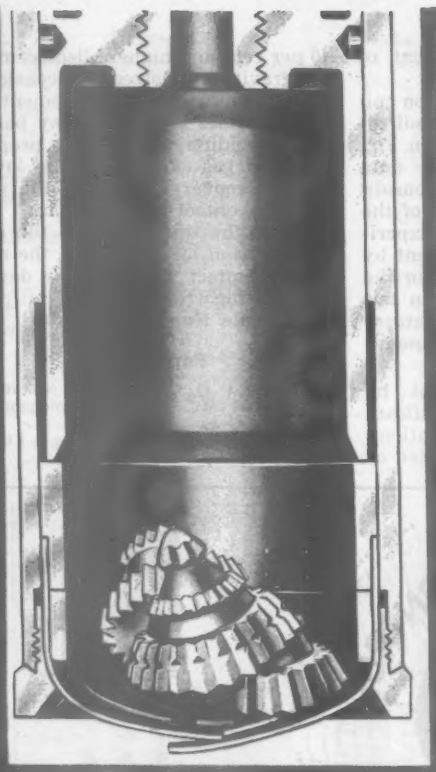
A striking illustration of the value of a mud weight recorder in preventing blowouts is provided by the following incident.

Drilling at 7384 ft. a joint of drill pipe was added to the string at 9:55 p. m. The air resulting from the connection returned to the surface at 11:10 p. m. and was registered on the automatic mud weighing machine chart. Circulation time had previously been established at 1 hr. 15 min. At 11:50 p. m. the mud machine recorded a second drop in mud weight on or about the time the hole had been drilled to 7395 ft. It was estimated that a gas sand had been encountered at approximately 7390 ft. which was about an hour previous to its arriving at the surface. The weight of the mud dropped to 15.1 lb. and was immediately raised to 15.3 lb. An electrical log showed a sand from 7387 to 7400 ft. which was later tested. Thus, first by having a continuous record of the mud weight coming out of the flow line and second by instantaneous interpretation of this record by a mud engineer in constant attendance, corrective steps could be taken in time to prevent the well from getting out of control.

FOR COMPLETE INFORMATION—See page 2874 of the 1943-44 edition of the Composite Catalog.

WARREN AUTOMATIC TOOL CO.

1920 HUSSION · HOUSTON, TEXAS



In Standard's KCL-20-13

It Picked up a Lost Cone THREE MILES DOWN!

On the **first** run, a 5" Cooper Die-Formed Basket picked up a 5⅞" rock bit cone **16,084 feet** down in the world's deepest well—Standard of California's KCL-20-13. Run in on a 3½" drill pipe, the Cooper Basket was on bottom for only about **2 minutes.**

For Service Call

Acme Fishing Tool Co. • Wilson Supply Co.
Baash-Ross Tool Co.

Mfg. by ACME PATENT DEVELOPMENT CORP.,
2680 Atlantic Ave., Long Beach, Calif.

Distributor: LIBERTY OIL TOOL CO.,
P. O. Box 1548, Long Beach 1, Calif.

Export Representative: Lucey Export Corp.

COOPER
DIE-FORMED
BASKET

Screens for Wells Having Unconsolidated Oil Sands

Perforated pipe and screens.—Unconsolidated oil sands generally need to be positively excluded from the well bore by perforated pipe or screens. If screens are not set, fine-grained sand flows with the oil into the well, increases the weight to be lifted, wears out tubing, pump valves and chokes, fills up separators and flow tanks, and becomes a waste and nuisance to any operator. Sand troubles can be overcome by correctly finishing the well and setting the right type of pipe perforation and size of screen.

Perforations used in pipes are either round holes or slots or combinations of the two. The slots are either longitudinal with the pipe or transverse to it, and are milled either from the inside or outside of the pipe. The round holes vary from ⅛ to ⅜ in. in diameter, and the slots from 0.030 to 0.250 in. in width and from 1 to 3 in. in length. The holes or slots are arranged in rows longitudinally with the pipe and in most cases are staggered. In some makes of slotted pipe, the slots are grouped and the groups are arranged in rows or staggered.

The greatest strength with the largest percentage of openings is obtained with horizontally cut slots. A test at the University of Texas engineering laboratory showed that 6-in. pipe cut with vertical slots of 0.030 gage failed with a load of 22,660 lb. The same pipe with horizontal slots failed at 61,110 lb.

The holes or slots may be wrapped with wire or with bands of metal set a small fraction of an inch apart. Wrapped or screen covered, peforated pipe is called a screen. Two types of screens are in use, the wire-wrapped screen and the button-type screen. The button-type screen consists of perforations covered with slotted metal disks brazed into each circular perforation.

Size of screen openings.—Openings in screen pipe set in Gulf coastal wells range from 0.007 to 0.010 in. in width. A majority of the screens commonly used measure 0.008 to 0.009 in. The following table shows the gage number or mesh size of five makes of screens in common use.

SIZES AND GAGE NUMBERS OF FIVE SCREENS USED IN GULF COAST REGION

Openings	Mesh or gage No.		
In.	Getty	McEvoy	Others*
0.06	10	60	060
0.05	12	50	050
0.04	15	40	040
0.03	20	30	030
0.02	30	20	020
0.015	40	15	015
0.012	50	12	012
0.010	60	10	010
0.009	70	9	009
0.008	80	8	008
0.007	90	7	007
0.006	100	6	006
0.005	120	5	005
0.004	150	4	004

*Layne & Bowler, Stancliff, and Emsco.

Selection of size of screen openings.—The selection of the correct size and type of screen for an oil well depends upon the size of the oil-sand grains, the differential pressure when the well is producing, and the corrosiveness of the fluids passing through the screen. Much experimental work on adaptation of screen sizes to different textures of oil sand grains has been carried on by Coberly[2], Chenault[1], Wilson[4], and Miller[3].

It has been found that the coarser grains of sand pack solidly around the screen openings and build up a sand filter which tends to exclude the fine particles even where fairly high differential pressures are built up, so that a screen size does not need to be selected small enough to exclude the smallest particles of sand. The use of screens with wider openings results in a lower pressure drop through the screen for a given rate of flow and hence a higher flow capacity. The best selection, therefore, consists in choosing the size screen which will give the smallest pressure drop and yet retain all the sand.

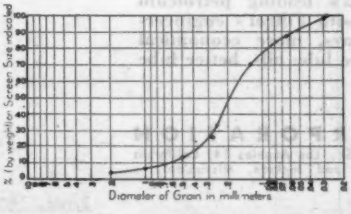


Fig. 1—Graph showing method of plotting weight analyses of screened oil sands against particle size to determine uniformity coefficient of sand and correct size of screen to set in an oil well

Graser found that a screen will restrain the flow of sand through it effectively when the width of the screen openings is less than twice the average diameter of the largest one-seventh (14.3 per cent) of the sand grains banking it. The method of determining the average diameter of the largest 14 per cent of the sand grains consists in making a screen analysis of the oil sand. A small sample of the oil sand, consisting of about 100 grams, is extracted from a core with pentane to remove all oil and is dried and weighed. The sand is then screened through a standard set of Tyler screens for 15 minutes, each individual fraction weighed, its weight in grams recorded, and the per cent by weight of each fraction calculated. The results are then made into a graph on semilogarithmic paper by plotting the accumulative per cent against grain size.

A typical oil-sand analysis is shown below and the graph obtained from this analysis in Fig. 1. Next, find from the curve the minimum size of the upper 14 per cent of the sand grains. This figure represents the size of screen to select. If the oil sands are nonuniform, it is best to make a number of determinations and to select the smallest-size screen opening indicated as a result of the tests.

SCREEN ANALYSIS OF AN OIL SAND FROM SEAL BEACH, CALIFORNIA*

Per cent by weight, accumulative	Wentworth scale size of screen in mm. on which sand is retained	Nearest corresponding Tyler screen number
3.7	2.0	9
6.5	1.0	16
12.2	0.5	32
32.5	0.25	60
69.3	0.125	115
86.4	0.0625	250
Passed through		
98.0	0.0625	

*Analysis made by F. G. Tickell.

REFERENCES

1. Chenault, R. L., Experiments on Fluid Capacity, Plugging of Oil-Well Screens: The Oil and Gas Journal, vol. 37, pp. 54-62, 65, June 9, 1938.
2. Coberly, C. J., Selection of Screen Openings for Unconsolidated Sands: Pet. Eng., vol. 9, No. 2, pp. 96-100, Nov. 1937.
3. Miller, Albert, Liners, Perforated and Screen Pipe: Jour. Inst. Pet. Tech., vol. 20, pp. 34-50, 1934.
4. Wilson, C. S., Selection and Use of Screened Pipe: A.I.M.E. Trans., vol. 103, pp. 116-135, 1933.

Series prepared by F. B. Plummer, professor, petroleum engineering school, University of Texas

Engineers responsible for putting the world's most modern "Lube Oil" Plants "on stream" specify FILTROL Adsorbents . . .

Sun Oil Company's lube oil plant

The dramatic evidence of superiority is the fact that modern "lube oil" plants throughout the world have gone "on stream" with Filtrol adsorbents.

Underlying this commercial performance are the years of experience that form the background for the present leadership of Filtrol Adsorbents.

From almost the beginning, better lube oils and more economical processing have been synonymous with Filtrol Adsorbents.

Hand in hand, America's leading petroleum engineers have worked with Filtrol's engineers in developing better ways, more economical means of producing more lube oils, better lube oils, at lower costs.

FILTROL CORPORATION
General Offices: 634 S. Spring St., Los Angeles 14, California
Plants: Vernon, California and Jackson, Mississippi

PRODUCTS OF **Filtrol*** CATALYSTS AND ADSORBENTS

RESEARCH AND DEVELOPMENT

*Reg. U. S. Pat. Off.

"Good Makings"
Make a Good Water System

You can always put your utmost confidence in a Layne Well Water System. Everything from the method used in drilling and finishing the well to the design, manufacture and installation of the pump can be trusted for highest efficiency, most durable quality and the longest life of service.

Shown above is a system recently completed for a major food manufacturer. Running true to Layne form, this system out performs its guarantee, producing nearly twice as much water as other wells in the same locality. This manufacturer knew what to expect. He already owns four other Layne Well Water Systems, all of which have always given outstanding service. He knows how little it costs to operate Layne Systems, how much water these systems produce and how small the upkeep cost.

Layne is already in postwar work. Many postwar installations are now being made. Others will soon be started. All will be of the world famous Layne quality.

If you need more water, either from entirely new wells and pumps, or from efficiently modernized old ones, write, wire or phone for the planning and estimating services of a Layne engineer. No obligation. Address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

***LAYNE PUMPS** — fulfill every need for producing large quantities of water at low cost from wells, streams, mines or reservoirs. Send for literature.*

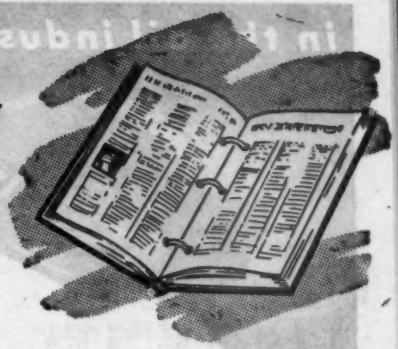
AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Texas Co., Houston, Texas ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Western Co. of Minnesota, Minneapolis, Minn. ★ International Water Supply Ltd., London, Ontario, Canada ★ Layne-Hispano Americana, S. A., Mexico, D. F.

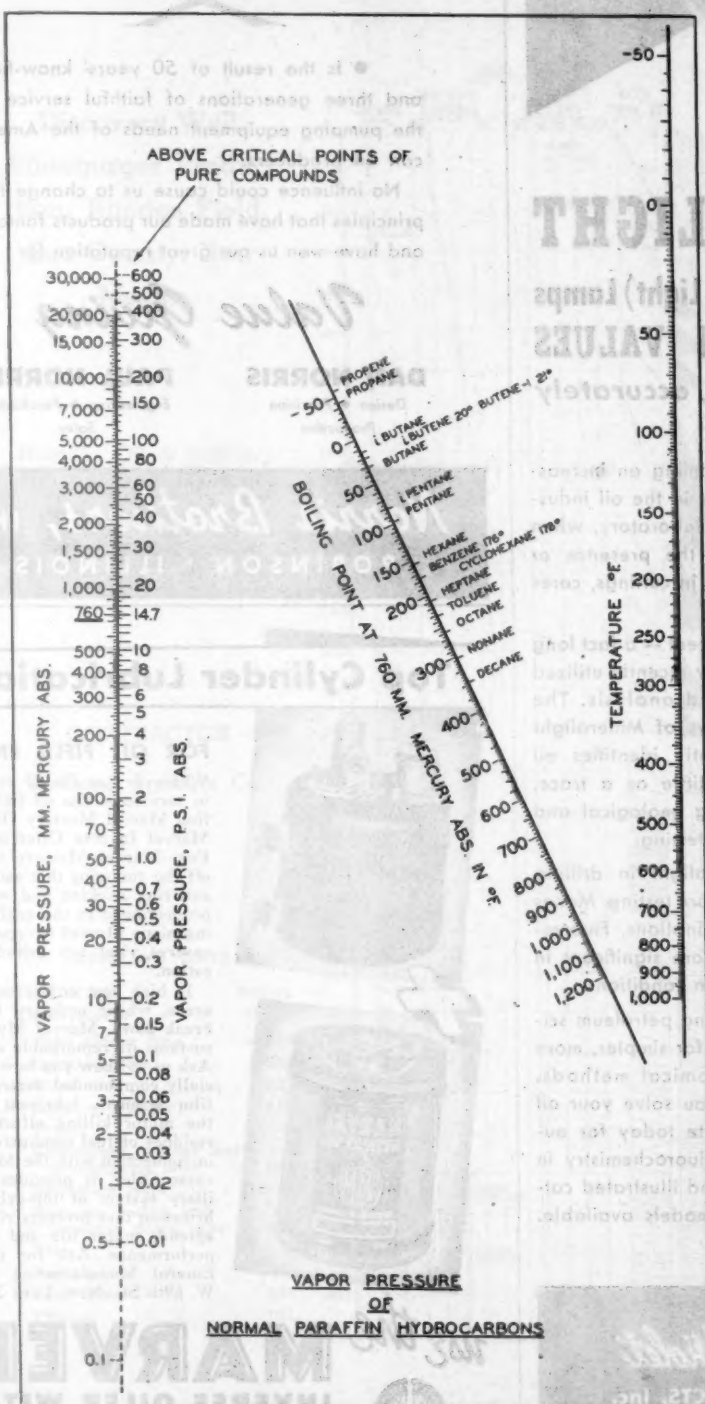
LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL





VAPOR PRESSURE OF NORMAL PARAFFIN HYDROCARBONS

Vapor Pressure

THE tendency of a liquid to vaporize, boil, or pervade the gas space above it, is measured by vapor pressure. If the liquid is confined so that there is no air (or inert) gas above it, the vapor pressure is the pressure at which the liquid will boil at various temperatures. In the presence of gaseous material the liquid tends to vaporize in proportion to its vapor pressure so that it pervades the gas even though it is below its boiling point. The left scale on the chart is the vapor pressure, the center scale is the boiling point at atmospheric pressure (760 mm. or 14.7 psia.) and the right scale is the temperature of the liquid. It is based primarily on the behavior of normal paraffin hydrocarbons but it is reasonably accurate for other hydrocarbons (except aromatics), oils, and oil mixtures, and no other data are widely accepted. The pressure scale may also be used as partial pressure for systems which involve steam or inert gas.

1. Butane is held in a container that will attain 140° F. when in the sun. By connecting 140 on the right with 31 on the center, the vapor pressure (or pressure in container) on the left scale is seen to be 96.6 psia. or 96.6 less 14.7 equals 81.9 psig.

2. An oil is boiling at 300° F. in a vacuum still at 9 mm. pressure. Connecting 300 on the right with 9 on the left shows an atmospheric boiling point (center) of 554° F. Had the pressure been 200 psia. the liquid would have boiled at 822° F.

No. 38 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

in the oil industry, too!

MINERALIGHT

Ultra Violet (Black Light) Lamps FIND HIDDEN VALUES

instantly, easily, accurately

FIELD AND LABORATORY TESTING

Mineralight is becoming an increasingly important factor in the oil industry in both field and laboratory, when used in determining the presence or absence of petroleum in cuttings, cores and rotary mud.

PROSPECTING

Petroleum is fluorescent — a fact long recognized — but only recently utilized for identification and analysis. The magic ultra violet rays of Mineralight positively and instantly identifies oil concentrations of as little as a trace, thereby supplementing geological and other data in surface testing.

CORE TESTING

The use of Mineralight in drilling operations simplifies core testing. Makes "on the spot" determinations. Fluorescent color variations are significant in determining production conditions.

CORRELATING SHALES, SANDS MUDS

IDENTIFYING CRUDE SOURCES

Mineralight is helping petroleum scientists in their search for simpler, more efficient, more economical methods. This lamp can help you solve your oil testing problems. Write today for authoritative bulletin "Fluorochemistry in Petroleum Science" and illustrated catalog showing many models available.

Ultra Violet
PRODUCTS, Inc.
LOS ANGELES 27, CALIFORNIA

NORRIS BROTHERS
Quality

● Is the result of 50 years' know-how and three generations of faithful service to the pumping equipment needs of the American oil producers.

No influence could cause us to change the principles that have made our products famous and have won us our great reputation for

Value Giving

DAN NORRIS
Design • Precision Production

PAUL NORRIS
Engineering • Purchasing Sales

Norris Brothers, INC.
ROBINSON · ILLINOIS

Top Cylinder Lubrication

FOR OIL FIELD ENGINES!

Wherever gas fueled engines are in service in the oil fields, you'll find Marvel Mystery Oil and the Marvel Inverse Oiler in service. For, Marvel Mystery Oil heads off the gumming that causes valve and ring sticking and when it is proportioned to the engine by the ingenious Marvel Inverse Oiler it assures vital top cylinder lubrication.

In high heat engine combustion areas, where ordinary lubricants break down, Marvel Mystery Oil sustains its remarkable efficiency. Ask us to show you how this specially compounded, detergent, high film strength lubricant combats the motor killing effects of the residues of fuel combustion. Used in connection with the Marvel Inverse Oiler, it provides an auxiliary system of top-cylinder lubrication that protects vital parts, extends motor life and improves performance. Ask for the facts. Emerol Manufacturing Co., 242 W. 69th St., New York 23, N. Y.

use the **MARVEL**
INVERSE OILER WITH MARVEL MYSTERY OIL

Journalog

No. 69

A FEATURE OF THE OIL AND GAS JOURNAL

Discovery Well, Ellenburger Production, Rhodes Field, Lea County, New Mexico

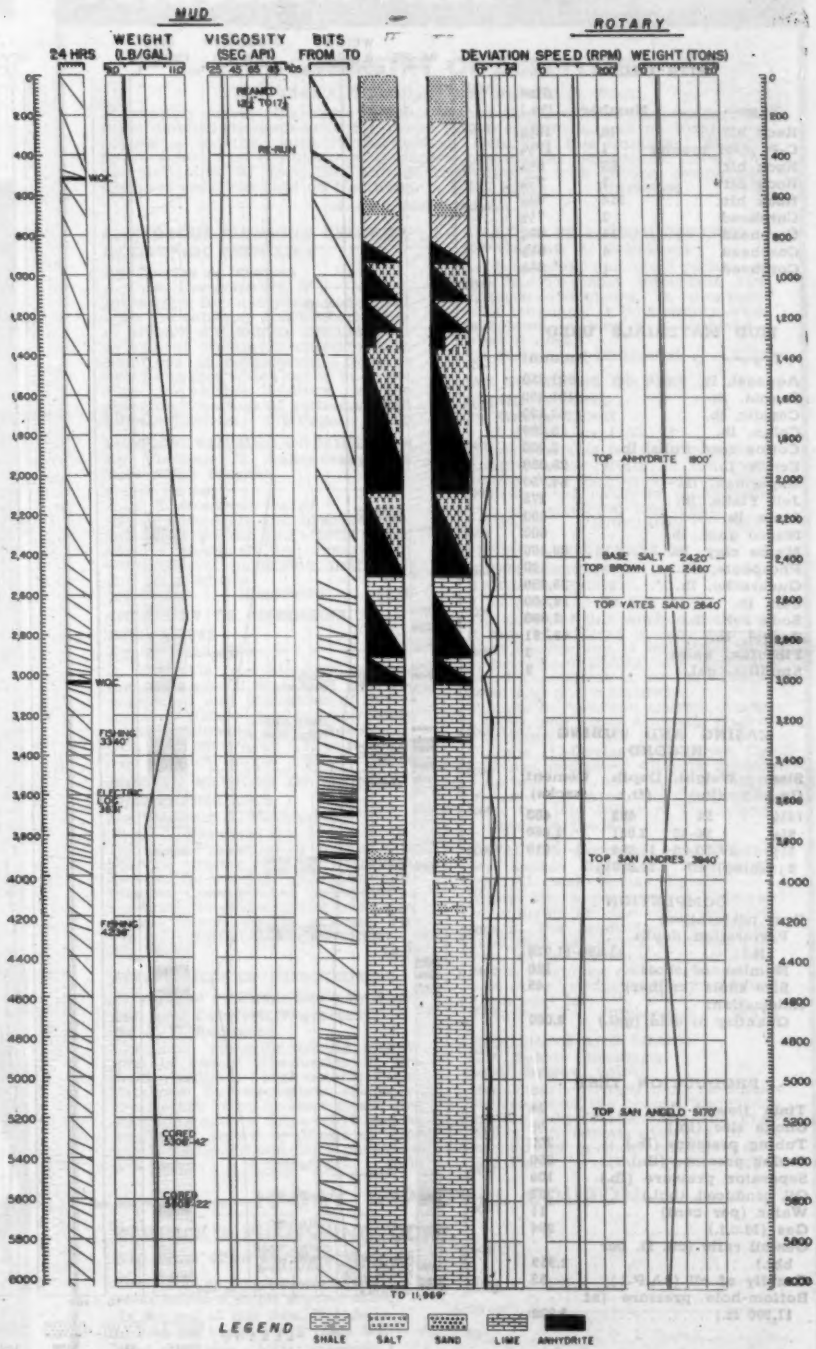
Humble Oil & Refining Co. 1 Federal Leonard Oil Co.,
SE SW 12-26-37.
Elevation 3,013 ft.

CONTRACTOR

Loffland Brothers Co.

DRILLING DATA

Type of rig	**Rotary**
Time record:	**Days**
Total rotary time	**459.00**
Rotating time	**269.59**
W.O.C.	**13.27**
Logging (Caliper)	**0.92**
Coring	**15.28**
Circulating, mixing and conditioning mud	**6.54**
Drill-stem tests	**10.59**
Running casing and breaking down pipe	**2.00**
Trips	**109.46**
Repairs	**21.10**
Shut down	**2.68**
Fishing	**7.57**



(Continued on Next Page)

Journalog

A FEATURE OF THE OIL AND GAS JOURNAL

BITS USED

Type—	Number	Size (in.)
Rock bit	16	12¼
C-P pilot reamer	1	17¼
Rock bit	63	8¾
Rock bit	1	7⅞
Rock bit	314	8¾
Corehead	2	7½
Corehead	14	8¾
Corehead	4	8½
Corehead	1	6¼

MUD MATERIALS USED

Type—	Amount
Aquagel, lb.	221,250
Baroid, lb.	191,400
Caustic, lb.	42,400
Colox, lb.	10,000
Cotton seed hulls, lb.	2,000
Ezmix, lb.	26,000
Impermex, lb.	64,750
Jell Flake, lb.	275
Lime, lb.	500
Magco gum, lb.	600
Marco clay, lb.	68,400
Phosphate, lb.	100
Quebracho, lb.	38,300
Salt, lb.	18,400
Soda ash, lb.	2,800
Zeogel, lb.	45,191
Fibrotex, bales	9
Stabilite, gal.	9

CASING AND TUBING RECORD

Size (in.)	Weight (lb.)	Depth (ft.)	Cement (sacks)
13⅜	54	483	400
9⅝	36-40	3,021	2,060
5½	17-20-23	11,964	810
2 (tubing)	4.7	11,920½	....

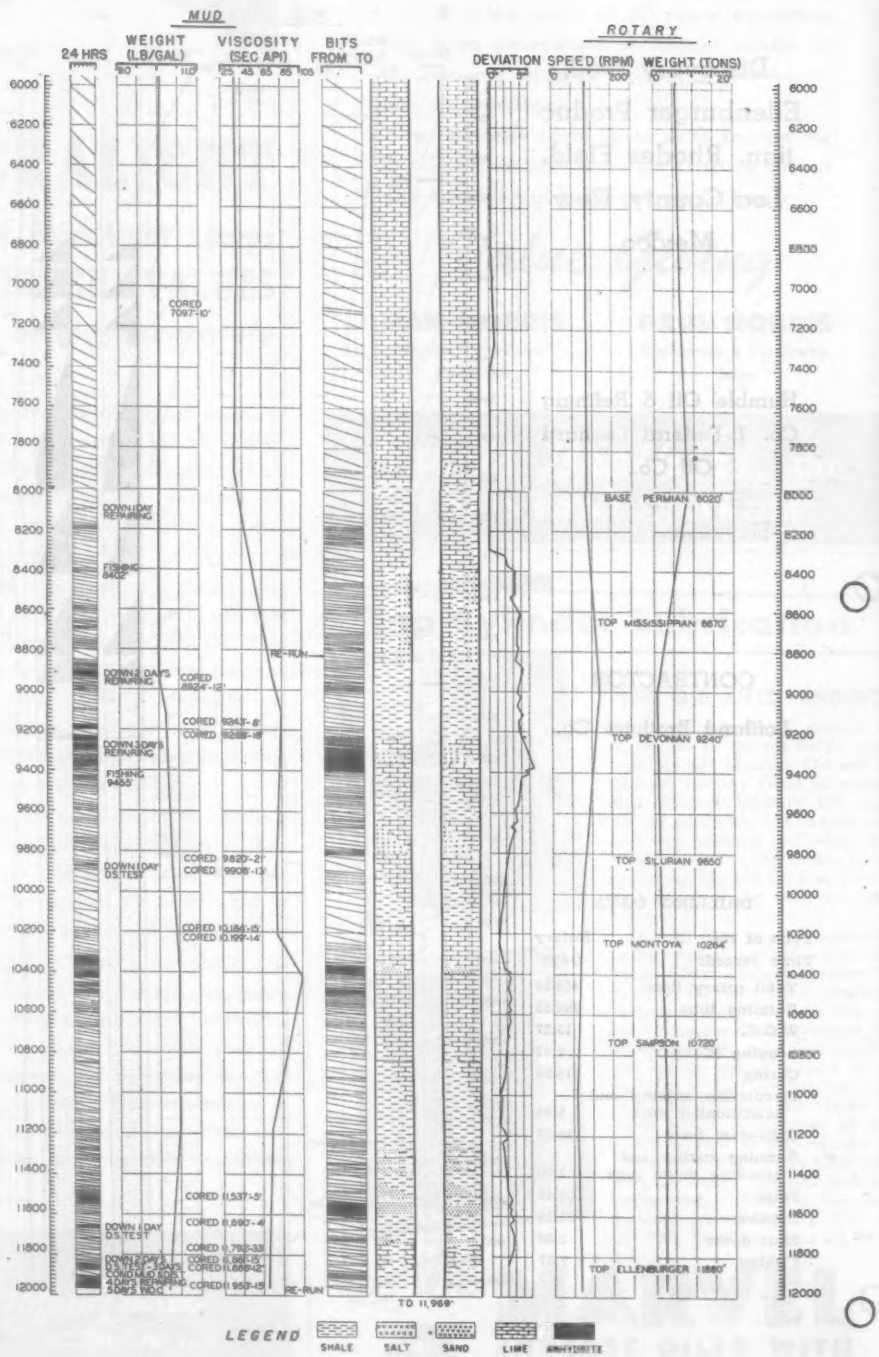
COMPLETION

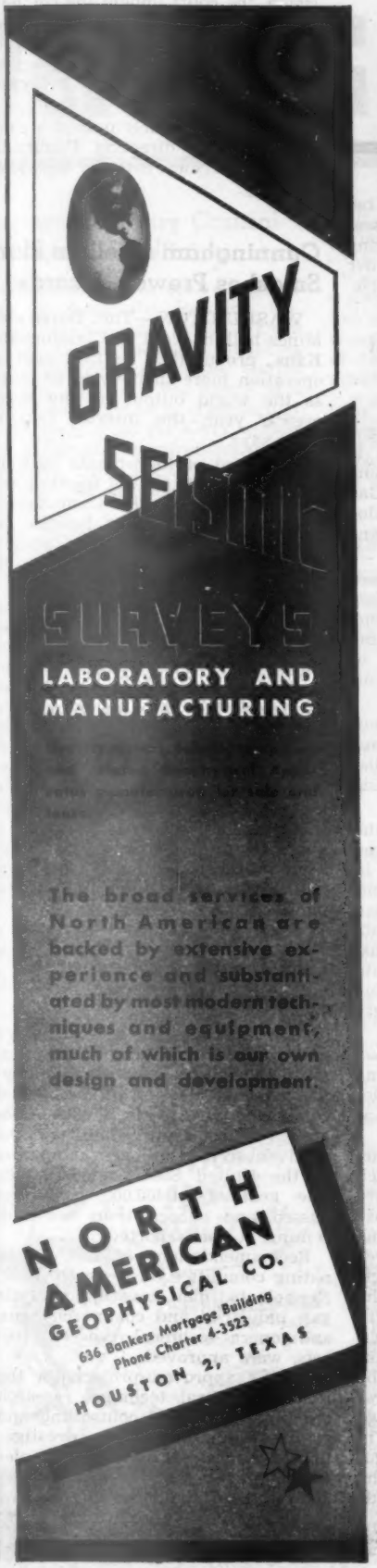
Gun perforation:
- Perforation depth (ft.) 11,890-11,928
- Number of shots 120
- Size shots (caliber) 45

Acidization:
- Quantity of acid (gal.) 3,000

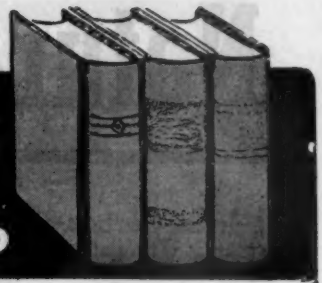
PRODUCTION TEST

Time flowed (hr.)	24
Choke size (in.)	½
Tubing pressure (lb.)	200
Casing pressure (lb.)	850
Separator pressure (lb.)	100
Oil produced (bbl.)	302
Water (per cent)	11
Gas (M.c.f.)	894
Gas-oil ratio (cu. ft. per bbl.)	2,959
Gravity of oil (°A.P.I.)	50
Bottom-hole pressure (at 11,900 ft.)	5,230




GRAVITY
SEISMIC
SURVEYS
LABORATORY AND MANUFACTURING
The broad services of North American are backed by extensive experience and substantiated by most modern techniques and equipment, much of which is our own design and development.
NORTH AMERICAN
GEOPHYSICAL CO.
636 Bankers Mortgage Building
Phone Charter 4-3523
HOUSTON 2, TEXAS

REINHOLD BOOKS in the PETROLEUM FIELD



THE CHEMISTRY OF ACETYLENE

By Julius A. Nieuwland and Richard R. Vogt

Thoroughly surveys the entire literature concerning acetylene compounds. Features detailed discussions of the properties, preparations, and purification of acetylene, together with its derivatives. Describes this important gaseous hydrocarbon with combinations of various non-metallic substances. Covers the polymerization of acetylene, and its condensation with carbon compounds. Features complete data on Neoprene. 216 Pages Illustrated $4.00

A. C. S. Monograph No. 99

ANHYDROUS ALUMINUM CHLORIDE IN ORGANIC CHEMISTRY

By Charles A. Thomas

A. C. S. Monograph No. 87

Important for everyone concerned with the catalysis and isomerization of organic compounds. Discusses reactions of aluminum chloride with hundreds of compounds — features exact changes which occur in structure. Invaluable addition to the research literature of petroleum and allied industries. 972 Pages $15.00

CHEMICAL REFINING OF PETROLEUM

By Vladimir A. Kalichevsky and Bert Allen Stagner

Second Edition

A. C. S. Monograph No. 63

A comprehensive and practical discussion of the use and effects of the various chemicals and reagents in refining and modifying petroleum and its products.

550 Pages Illustrated $7.50

CHEMISTRY OF PETROLEUM DERIVATIVES

By Carleton Ellis

A veritable encyclopedia of the mass of material concerned with development and utilization of derivatives of natural gas and petroleum —extraordinarily comprehensive.

Vol. I —1,285 Pages Illus. $18.00
Vol. II—1,464 Pages Illus. $20.00

MODERN METHODS OF REFINING LUBRICATING OILS

By Vladimir A. Kalichevsky

A. C. S. Monograph No. 76

Includes: Properties of refined oils. Modern refining methods. Petroleum waxes. De-waxing. Asphaltic substances. Conventional de-asphalting methods. Solvent refining processes. Single, mixed, double solvents. Viscosity. Oxidation. Fluorescence.

253 Pages $6.00

CONVERSION OF PETROLEUM — Production of Motor Fuels by Thermal and Catalytic Processes

By A. N. Sachanen

Complete, up-to-the-minute discussion of recent discoveries in the field. Includes: high-octane fuels; catalytic hydrogenation or polymerization of by-product gases; degumming agents; tetra-ethyl lead as antiknock agent; synthesis of aromatic hydrocarbons from paraffins.

413 Pages Illustrated $6.00

AMAZING PETROLEUM INDUSTRY

By Vladimir A. Kalichevsky

An interesting and vivid picture of the world's most important raw material—Petroleum. In non-technical language, it tells simply what petroleum is—how it is obtained—what it does.

234 Pages Illustrated $2.25

THE REACTIONS OF PURE HYDROCARBONS

By Gustav Egloff

A. C. S. Monograph No. 73

Makes available for the first time a comprehensive study of the reactions of pure hydrocarbons resulting from thermal, catalytic, photochemical, and electrical treatment.

879 Pages Illustrated $16.75

PHYSICAL CONSTANTS OF HYDROCARBONS

By Gustav Egloff

A. C. S. Monograph No. 78

The scope of this work is such that it may be utilized in pure and applied science and in industries such as petroleum, natural and manufactured gas, chemical, rubber, plastic, resin and pharmaceutical.

Volume I—Paraffins, Olefins, Acetylenes, and other Aliphatic Hydrocarbons. 416 Pages $9.00
Volume II—Cyclanes, Cyclenes, Cyclynes, and other Alicyclic Hydrocarbons. 608 Pages $12.00
Volume III—Aromatic Compounds. By the late Julius A. Nieuwland. Ready in the Fall.

CATALYSIS—Inorganic and Organic

By Sophia Berkman, Jacques C. Morrell, and Gustav Egloff

Shows the importance of Catalysis to industry by discussing the process in the production of aviation fuel, high explosives, synthetic rubber, dyes, medicinals, pharmaceuticals, perfumes, edible fats and oils and other products hitherto derived from coal tar.

1,150 Pages Illustrated $18.00

EMULSIONS AND FOAMS

By Sophia Berkman and Gustav Egloff

This clearly-written and well-digested review of the present knowledge of the subject assembles and evaluates the recent advances in the technology of these phenomena.

591 Pages Illustrated $8.50

——10-DAY APPROVAL COUPON——

REINHOLD PUBLISHING CORP.
330 West 42nd St., New York 18, N. Y.

Please send on ten days' approval the books indicated on the attached sheet. At the end of that time, if I decide to keep the books, I will remit indicated price plus postage; otherwise I shall return the books postpaid.

Name _____
Address _____
City _____ State _____
Employer _____ O&GJ-4-21-45

☐ Send Free Catalog listing over 200 scientific books.

Natural Gas

Odessa Carbon-Black Plant To Be World's Largest

ODESSA, Tex.—The carbon-black plant under construction here as part of the government program to increase production of synthetic rubber, will be the largest in the world.

The first unit is to be completed this month. Work is being rushed on the two other units. The plant, covering a square mile, will have a collection system of 46 miles of pipe. It will cost $9,000,000 and produce approximately 56,000,000 lb. of black annually.

The pipe lines are being laid to oil fields to obtain sour gas. The collection system will expand to the Goldsmith, North Cowden and Judkins pools. At each source of gas, a treater plant will be installed to remove the impurities before gas is piped to the camp site.

In the three units 536 burner houses will be built, each house 12 ft. wide and 120 ft. long.

Defense Plant Corp. is financing the plant which will be leased to United Carbon Co., Inc., of Maryland.

Columbia Announces Great Additions to Gas Reserves

WILMINGTON, Del. — Arrangements by which its natural-gas reserves have been virtually doubled are announced by Columbia Gas & Electric Corp. in its annual report.

At the southern end of its system, Columbia gets 100,000,000 cu. ft. daily from Tennessee Gas & Transmission Co. Starting late this year, it will get 25,000,000 at the western end from Panhandle Eastern Pipe Line Co. Panhandle has agreed to deliver another 25,000,000 per day for the duration of the war or 5 years. Tennessee Gas is seeking to increase its facilities and Columbia may get some part of 60,000,000 cu. ft. additional daily if the expansion is approved.

Columbia estimates that its own Appalachian reserves amount to 2½ trillion cubic feet and the outside deals will bring total reserves to 4 trillion. The system sold 170 billion in 1944.

As a means of better meeting peak loads, plans are being developed to expand the capacity of underground storage facilities. Depleted Appalachian gas fields become gas reservoirs during off-season and the gas is taken out during the winter. The report says wider use of gas appears to be inevitable.

High Court Upholds Right Of FPC to Reduce Rates

WASHINGTON. — The right of Federal Power Commission to regulate wholesale natural-gas rates is upheld in Supreme Court decisions affecting Colorado Interstate Gas Co., Canadian River Gas Co., Colorado-Wyoming Gas Co. and Panhandle Eastern Pipe Line Co.

The court declared it was proper for the commission to fix rate bases for interstate wholesalers without separating wells and gathering facilities, which are not subject to regulation, from transportation and distribution facilities.

The commission directed a reduction of $2,065,000 annually in charges made by Colorado Interstate to distributing companies in Colorado and Wyoming.

The company complained that the commission improperly considered the value of all its properties in determining a rate base. It contended that since the commission has no authority over intrastate sales or over direct sales to industrial consumers the rates should have been based only on the value of properties used for interstate gas sales.

The commission ordered Canadian River to make reductions totaling $561,000 annually in favor of Colorado Interstate and the Clayton Gas Co.

Justice Jackson wrote a concurring opinion in both cases in which he said he would like to reverse the commission orders, "not because I think the rate reduction is wrong, but because I think the real inwardness of the gas business as affects the future has been obscured by the commission's preoccupation with bookkeeping and historical matter. Such considerations may be relevant to rate-based theories, but will be very satisfying to a coming generation that will look back and judge our present regulatory method in the light of an exhausted and largely wasted gas supply. But as the matter stands I see no legal grounds for reversal."

In the Colorado-Wyoming decision, the court upheld the commission's rate-fixing processes but remanded the case for further proceedings in connection with a portion of the ordered rate reduction of $119,000 a year.

The court similarly upheld a commission order directing Panhandle Eastern to reduce rates by $5,095,380 annually.

Cunningham's Helium Plant Smashes Prewar Records

WASHINGTON.—The Bureau of Mines helium plant at Cunningham, Kans., produced in its first year of operation more than twice as much as the world output in any fiscal prewar year, the Interior Department says.

The third of four plants built in the bureau's $16,000,000 wartime expansion program, the Cunningham unit started producing helium for shipment to the Navy on January 17, 1944, just 286 days after construction of the plant was begun.

Helium is extracted from natural gas flowing to commercial and domestic markets from the nearby Cunningham field. Because of the fluctuating demands for natural gas, every effort is made to extract and store all of the helium, thereby conserving quantities which otherwise might be left in the gas en route to the markets and lost forever. In the rapid helium-extraction process, requiring less than a minute for a given volume of gas, only the helium is taken out, although some natural gas is used for fuel in the plant.

Gas Industry's Research Program Under Way

NEW YORK.—The gas industry's new research and promotional program is off to a good start following a recent meeting of the special committee of American Gas Association which is to administer the fund subscribed by gas companies of the United States and Canada. The goal of $1,400,000 has been passed and subscriptions are still coming, it was reported.

Recommendations of the coordinating committee on research, E. P. Noppel, chairman, covering domestic gas, industrial and commercial gas, and general technical research projects, were approved.

Among approved projects in the field of general technical research are investigation of controlling and gaging combination wells, investigation of natural-gas hydrates, completion of mixed-gas research and development of standard test burners, organic sulfur research, iron corrosion fellowship.

REFINING

Cooperatives Buy Control Of Louisville Refining

LOUISVILLE.—A controlling interest in Louisville Refining Co., Inc., has been bought by Ohio Farm Bureau, Columbus, Ohio, marking the twelfth refinery in the United States to pass into the hands of a cooperative wholesale organization. At the same time the Ohio cooperative institution acquired control of Producers Pipe Line Co., Owensboro, Ky., an affiliate of Louisville Refining.

The refinery, which has a daily crude-oil capacity of 7,000 bbl., has been operating on a 4,000-bbl. basis. The same trade outlets will be served as in the past, it is announced, and there will be few changes in the plant personnel.

C. H. VosKoetter, formerly secretary-treasurer, will be general manager. Eli H. Brown, Jr., chairman and president, will be succeeded by J. M. Hodson, of Columbus. Murray D. Lincoln, general manager of Ohio Farm Bureau, will take the place of J. Fred Miles as vice president.

It is understood that products resulting from increased operations will go into cooperative distribution channels.

Gulf Coast Gasoline Stocks Continue Downward Trend

HOUSTON.—Stocks of all grades of gasoline and naphthas continued their downward trend during the second half of March at plants in Gulf Coast Refiners Association. They were reported at 1,644,666 bbl., a drop of 189,168. Automotive gasoline stocks were 606,287 bbl., a decrease of 83,248. About 20 per cent of this total is a special military grade not available for civilian use.

Total stocks of all products were reported at 3,131,403 bbl., a decrease of 314,863. A year ago the total was 3,209,466. Crude runs totaled 134,757 bbl. daily.

April Crude-Sharing Order Touches New Low Record

CHICAGO. — Fifteen refiners in District 2, Petroleum Administration for War, have received directives requiring them to share with 15 other refiners in the district a total of 15,255 bbl. of crude oil daily during April, under the wartime crude-allocation program. This is the smallest quantity of crude involved since the program was established.

Gasoline From Natural Gas Promised by New Process

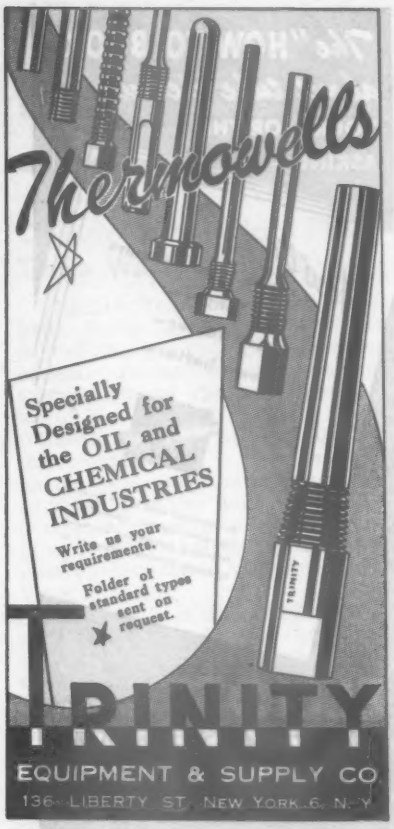
JERSEY CITY. — Production of motor gasoline from natural gas at about 5 cents a gallon is promised by a process disclosed by M. W. Kellogg Co. The new process, Kellogg says, will make it possible to produce other liquid hydrocarbons, such as diesel oil (90-100 diesel index) and butane. Under controlled conditions it also will yield various chemical products in the form of oxygenated compounds.

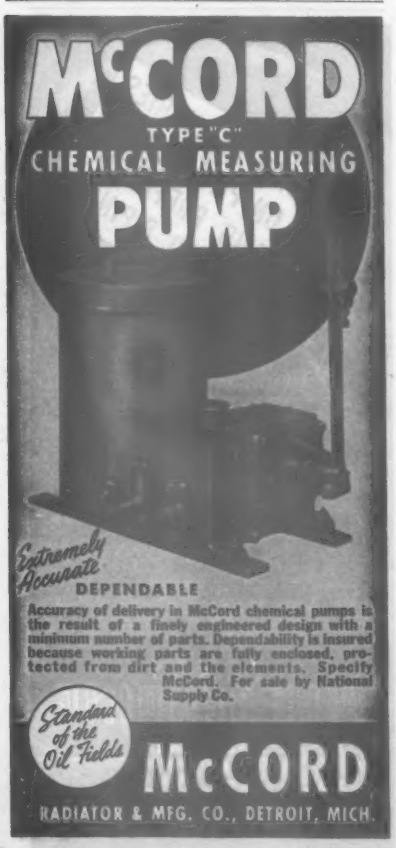
The following steps are involved, the company says: Purification, synthesis reaction, condensation, stabilization and fractionation of the liquid hydrocarbon products into gasoline and diesel oil, and the separation and recovery of the liquid chemical compounds.

Following the purification of the natural gas and its conversion to carbon monoxide and hydrogen, these gases in turn are converted by synthetic reaction in the presence of a selected catalyst, under controlled conditions, to the desired hydrocarbons and chemical compounds.

The company, now a subsidiary of Pullman, Inc., is not designing plants for the new process. A complete

LET ME SHOW YOU WHAT GOOD WATER CONDITIONING SERVICE REALLY IS!
Call JOHN FIELD-MAN ON YOUR NEXT WATER CONDITIONING JOB
LELAND HAMNER CO.
LELAND HAMNER CO.
P. O. Box 1063 - Capitol 9758 - Long Distance LD 2175
2211 PRESTON AVE. HOUSTON, TEXAS


Thermowells
Specially Designed for the OIL and CHEMICAL INDUSTRIES
Write us your requirements.
Folder of standard types sent on request.
TRINITY
TRINITY
EQUIPMENT & SUPPLY CO.
136 LIBERTY ST. NEW YORK 6, N.Y.


McCORD
TYPE "C"
CHEMICAL MEASURING
PUMP
Extremely Accurate
DEPENDABLE
Accuracy of delivery in McCord chemical pumps is the result of a finely engineered design with a minimum number of parts. Dependability is insured because working parts are fully enclosed, protected from dirt and the elements. Specify McCord. For sale by National Supply Co.
Standard of the Oil Fields
McCORD
RADIATOR & MFG. CO., DETROIT, MICH.

plant to produce a large volume of liquid hydrocarbons, it was estimated, would have a payout time of about 8 years, but a plant turning out both petroleum products and chemical compounds would pay itself off in about 3 years.

It should be noted, Kellogg says, that in calculating manufacturing cost at 5 cents a gallon of gasoline from the new synthol process, the value of the chemical compounds is excluded. The cost also is independent of the investment and profit from operation of the chemical plant.

The new process not only assures the economic availability of a large volume of gasoline and diesel fuel, the company says, but provides means for profitable development of the petroleum industry's resources with successful functioning of the chemical industry.

Railroads Making Study of Diesel Fuel Requirements

WASHINGTON.—The nation's railroads are making a survey of their diesel fuel requirements during coming months, and it is expected they will report their findings with a view to helping Petroleum Administration for War to balance supply and demand more satisfactorily. Rising needs of railroads in the Middle West and Texas are creating concern in the light of increasing war demands.

The diesel fuel used by railroads has a 50-cetane number, which corresponds roughly with the octane number of gasoline. Refining capacity has been hard pressed to produce this material, and the Navy recently called upon middle-western refiners for three times their previous output.

Problems involved were discussed at a meeting of railroad fuel purchasing agents with supply and transportation committees of PAW and the petroleum industry committees of the Middle West (District 2) and the Gulf and Southwest (District 3), just held at New Orleans.

Information developed at New Orleans indicated that fuel oil needs of the roads for April would be covered and that demand and supply would be virtually in balance for the month.

New Process for Making Ethyl Chloride Announced

NEW YORK.—A new process for making ethyl chloride, one of the most important chemicals used in manufacturing knock depressants for high-octane gasoline was announced here last week by Ethyl Corp. A $750,000 unit employing this process is under construction at the company's Baton Rouge, La., plant.

The process yields ethyl chloride by reacting chlorine with waste products from one of the present ethyl-chloride units at Baton Rouge. It was developed in view of the tight supplies of both alcohol and ethylene, compounds used in producing ethyl chloride through two existing processes.

Chlorine for the process is produced by breaking salt electrically into chlorine and sodium. The sodium is combined with metallic to form a lead-sodium alloy used in making tetraethyl lead.

The two methods already in operation for making ethyl chloride are based on hydrochlorination of alcohol and on hydrochlorination of ethylene. In the alcohol process, ethyl alcohol vapor and hydrochloric acid combine in the presence of a catalyst to form ethyl chloride and water.

In the ethylene process, ethylene gas is mixed with hydrogen chloride gas in the presence of a catalyst. The two gases first are passed through a reactor where hydrochlorination occurs, and later through a "flash drum" which distills off the lighter ethyl-chloride fractions, leaving the heavier polymer fractions. The ethyl chloride then is purified by fractionation. The first of two plants using the ethylene process was built in 1939.

CURTIN CENTRIFUGES

GIVE YOU QUICK, ACCURATE RESULTS WITH LESS EFFORT . . . AT LESS COST

Simple in design, ruggedly built for heavy duty service. Gear ratio and throw of crank produce required speed with no strain. Heads and cranks of 100 CC and 15 CC machines are interchangeable. Meets *A.S.T.M. Standard Method D-98* and *A.P.I. Code No. 25 requirements.* Ask for full details.

W·H·CURTIN & CO. Inc.
HOUSTON U.S.A. TEXAS

PIPE LINES

City Service Gas Seeks to Acquire Affiliate's Line

WASHINGTON.—May 9 has been set as the date for a hearing by Federal Power Commission on an application filed by Cities Service Gas Co., Bartlesville, Okla., for permission to acquire from its affiliate, Cities Service Transportation & Chemical Co., the latter's 231-mile natural-gas pipe line from the Hugoton field.

Facilities to be acquired include the 26-in. line extending east from a point near Guymon, Okla., to the Cities Service Gas Blackwell station in Kay County, that state, and a compressor station and dehydration plant at the western terminus of the line.

The application states that the company proposes to acquire the pipe line and facilities at their cost of construction less reserves for depreciation. This cost as of February 28 was fixed at $10,700,757 and the reserves for depreciation were $317,328. Cities Service Gas plans to finance the purchase by issue of $9,000,000 of its capital stock at par to its parent company, Empire Gas & Fuel Co., taking sufficient funds from its own treasury to make up the rest needed.

The line was built under orders issued in September 1943, and July 1944, to relieve a gas shortage in the Mid-Continent area.

Buckeye Starts Operation Of New Products Line

INDIANAPOLIS.—The new 8-in. line from Robinson, Ill., to Indianapolis, for movement of refined-oil products has been put into operation by Buckeye Pipe Line Co., which recently purchased the property from The Ohio Oil Co.

Laying of the pipe for this line was completed last December, but lack of station equipment at Indianapolis is understood to have delayed operation. A temporary unit has been installed, and oil products are reaching this city through it. The Indianapolis truck terminal will not be ready until June, according to reports. The line, with a daily capacity of 25,000 bbl., was constructed by Ohio Oil as a wartime project.

The line, a 105-mile carrier, will transport refined products from the eastern Illinois refinery center into Central Indiana, for distribution to the trade, and also will make connections possible with other pipeline facilities at Indianapolis, if desired, for moving on eastward or to the north.

Buckeye, a pioneer pipe-line operator, with extensive properties in Ohio, has for years accepted oil from its affiliate, Indiana Pipe Line Co., and in turn has delivered it to another affiliate, Northern Pipe Line Co., for movement to the East through Pennsylvania.

Rangely Line Expanded to Meet New Development

DENVER. — Decision of Utah Oil Refining Co. to lay 150 miles of 10-in. line from the Rangely field in northwestern Colorado to its main pipe-line station at Wamsutter, Wyo., was reached on the basis of current production and substantial improvement in the pool's prospects.

Previously, Utah Oil Refining Co. had planned a 6-in. line from the Rangely field to Craig, Colo., for serving the pool's transportation requirements. The 6-in. line, it was decided recently on the basis of Rangely field development, would prove inadequate for current service and would not accommodate prospective development. Twelve rigs are currently operating in Rangely and six more are expected to be moved in soon from Elk Basin.

Utah Oil Refining's decision to build a 10-in. line all the way from Rangely to Wamsutter station is predicated on anticipated increases in development drilling in the new Colorado field this summer. War Production Board and Petroleum Administration for War approval has been granted for the 10-in. line and construction will be expedited.

Wamsutter station is on Utah Oil Refining Co.'s trunk line from Wyoming to Salt Lake City where the company operates a modern refinery equipped to manufacture aviation gasoline and other military products.

A.P.I. Committee to Study Pipe-Line Transportation

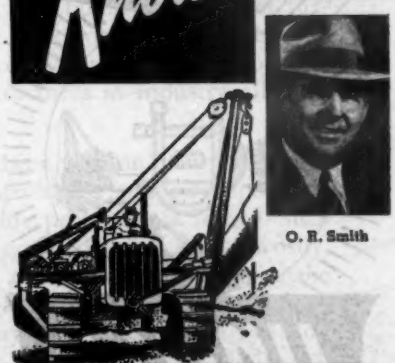
WASHINGTON. — Reports pertaining to pipe-line transportation issued by various federal agencies

CRC

PIPE LINE CONSTRUCTION EQUIPMENT

CRUTCHER-ROLFS-CUMMINGS
Pipe Line Equipment and Materials
Houston, Texas, U. S. A.

PIPELINE "Know-how"



O. R. Smith

PIPE LINE COMPRESSORS DITCHERS DOZERS
CONSTRUCTION WELDERS TRUCKS TRACTORS

SMITH CONTRACTING COMPANY
ODESSA, TEXAS

MAIN BUSINESS OFFICE
FORT WORTH NATIONAL BANK BLDG.
FORT WORTH 2, TEXAS

WHEN YOU WANT THE BEST IN PIPELINE CONSTRUCTION
Oklahoma CONTRACTING COMPANY DALLAS, TEXAS
SOUTH AMERICA
Apartado 1085
CARACAS, VENEZUELA

The Sign of GOOD PIPE LINE CONSTRUCTION
UNITED
CONTRACTING CO.
716 HAMILTON BUILDING
WICHITA FALLS, TEXAS
ROSE BLDG. • PAMPA, TEXAS

and private industrial organizations are to be a subject of study by a special committee from American Petroleum Institute, named by William R. Boyd, Jr., president. The committee is to make whatever recommendations it deems proper.

The committee comprises T. E. Swigart, president Shell Pipe Line Co., Houston, chairman; Hines H. Baker, Houston; James J. Cosgrove, Ponca City, Okla.; Fayette B. Dow, Washington; Arthur M. Gee, Findlay, Ohio; Bert E. Hull, Houston; J. Blair Moffett, Philadelphia; Charles R. Musgrave, Bartlesville, Okla.; A. W. Peake, Chicago, and Sidney A. Swensrud, Cleveland.

New U.S. Gas Pipe-Line Map Is Completed

A new natural-gas pipe-line map of the United States showing size of system and operating company has been completed by E. C. Jacobson, Tulsa. Dashes, dots and straight lines are used to differentiate between systems. The map also shows cities in which the supplying company operates distribution facilities as distinguished from municipal ownership. An index of operating companies with a list of states in which their facilities are located is inset on the map itself. Size of the map is 48 by 75 in., on a scale of 1 in. to 40 miles.

Northern Natural Plans to Extend Delivery Lines

WASHINGTON. — Federal Power Commission will hold a hearing May 2 on an application filed by Northern Natural Gas Co., Omaha, Neb., for permission to construct and operate additional facilities designed to increase delivery capacity by about 8,000,000 cu. ft. of gas daily. The proposed facilities, required to meet rising demands of customers north of the company's Clifton, Kans., compressor station, include one additional 1,300-hp. compressor unit each at the company's Bushton and Mullinville, Kans., compressor stations and about 15 miles of 24-in. loop line extending from a point in Ellsworth County to a point in Ottawa County, Kansas, with 16-in. tie-over lines and appurtenances.

It is estimated that firm load totaling 16,711,000 cu. ft. per day was added or contracted for during 1944. Utility companies served by applicant report the sale of over 8,600 house-heating jobs last year of which more than 6,500 had been installed. This constituted the principal part of the estimated increase of firm load. Additional interruptible load approximating 42,000,000 cu. ft. per day was added to the system during the past year. The estimated overall cost of the project is $910,848.

Humble Increased Oil Runs 46 Per Cent Last Year

HOUSTON. — An increase of 46 per cent in the volume of crude oil handled by Humble Pipe Line Co. in 1944 was disclosed here this week in the annual statement of its parent, Humble Oil & Refining Co.

Humble Pipe Line Co., wholly owned subsidiary of Humble Oil & Refining Co., gathered 550,000 bbl. of crude oil daily in 1944 from 19,000 wells. This volume was an increase of 95 per cent over the traffic in 1942.

Humble Pipe Line Co. handled an average of 570,000 bbl. daily through its main line in 1944, and its share of the volume handled by Bayou Pipe Line amounted to 15,000 bbl. daily. In addition, 96,000 bbl. daily of the oil gathered by Humble moved by tank cars, barges, or pipe lines owned by other companies. The net volume handled by Humble in its gathering and trunk-line operations was equivalent to one-seventh of the total crude-oil production in the United States.

Capital expenditures on pipe-line facilities were $3,860,000 in 1944, or $700,000 more than in 1943. The most important main-line projects were a combination 6 and 8-in. line 25 miles long to the Seeligson field in Southwest Texas and 14 miles of 8-in. loops on the lines from Webster station to the Baytown refinery. New gathering lines accounted for $1,640,000 of the capital expenditures.

Tank-car transportation remained at a relatively high level because of movements to the East Coast. In 1944, Humble loaded daily on tank cars about 62,000 bbl. of products and 31,000 bbl. of crude oil. This was about 5 per cent less than the volumes handled by the same methods in 1943.

PIPE LINE ENGINEERS AND CONTRACTORS
Let us handle your
BURLAP and COTTON BAG REQUIREMENTS
We are satisfactorily performing this service for your industry.
Central Ohio Bag & Burlap Co.
Columbus 8, Ohio
550-58 North Fourth
Adams 8888
Adams 1344
A. A. MICHAELSON
Proprietor

A new steel tape in your Master "STREAMLINE" — for ⅓ of its original cost — will give you a practically brand new rule. The chrome plated case is so sturdily built that you simply can't wear it out. So when the blade of your "STREAMLINE" needs replacing have a spare on hand — anyone can quickly replace the blade without instructions.

In addition to the replaceable blade feature, the "STREAMLINE" has a 7/16" tip for more easily making those "reach" measurements; a conveniently placed *positive* lever lock for holding reading on inside measurements; graduations on both sides and all edges of the blade.

You can't miss a measurement with the "STREAMLINE", its accuracy will not only be a source of satisfaction but will show in your work wherever you use it — in the home workshop or on the job.

Use the coupon for quick action.

$2.65 EACH COMPLETE WITH SPARE BLADE

TRADE MARK

MASTER

WOOD AND TAPE RULES

MASTER RULE MFG. CO., INC., DEPT. S-4
815 East 136th Street, New York 54, N. Y.

Please send me:

- ☐ STREAMLINE 6 ft. size ($2.00 ea.)
- ☐ STREAMLINE 8 ft. size ($2.25 ea.)
- ☐ 8 ft. replaceable blade (70c ea.)
- ☐ 6 ft. replaceable blade (65c ea.)

Name_____

Address_____

City_____ State_____

H.M.S. Agamemnon laying the first Atlantic cable.

Famous Facts

The first Atlantic cable was laid between Cape Breton, Nova Scotia, and Newfoundland. In 1857 the cable was completed to Ireland and the first messages sent between New York City and Europe the following year.

During the same decade, Bitumastic Enamel — the first product of its kind — was developed for the protection of steel ships against internal corrosion in bilges, double bottoms, coal bunkers, and other surfaces exposed to severe corrosion. For many years, it has given maximum corrosion protection to pipe lines, steel and iron structures in industry all over the world.

Bitumastic Enamel has been used on many thousands of miles of this country's gas and oil pipe lines because of its outstanding performance record. Such unexcelled qualities as good adhesion, high viscosity, resistance to soil stress, and superior flexibility, make Bitumastic Enamel ideal for giving maximum pipe line protection in every type of corrosive soil and climate.

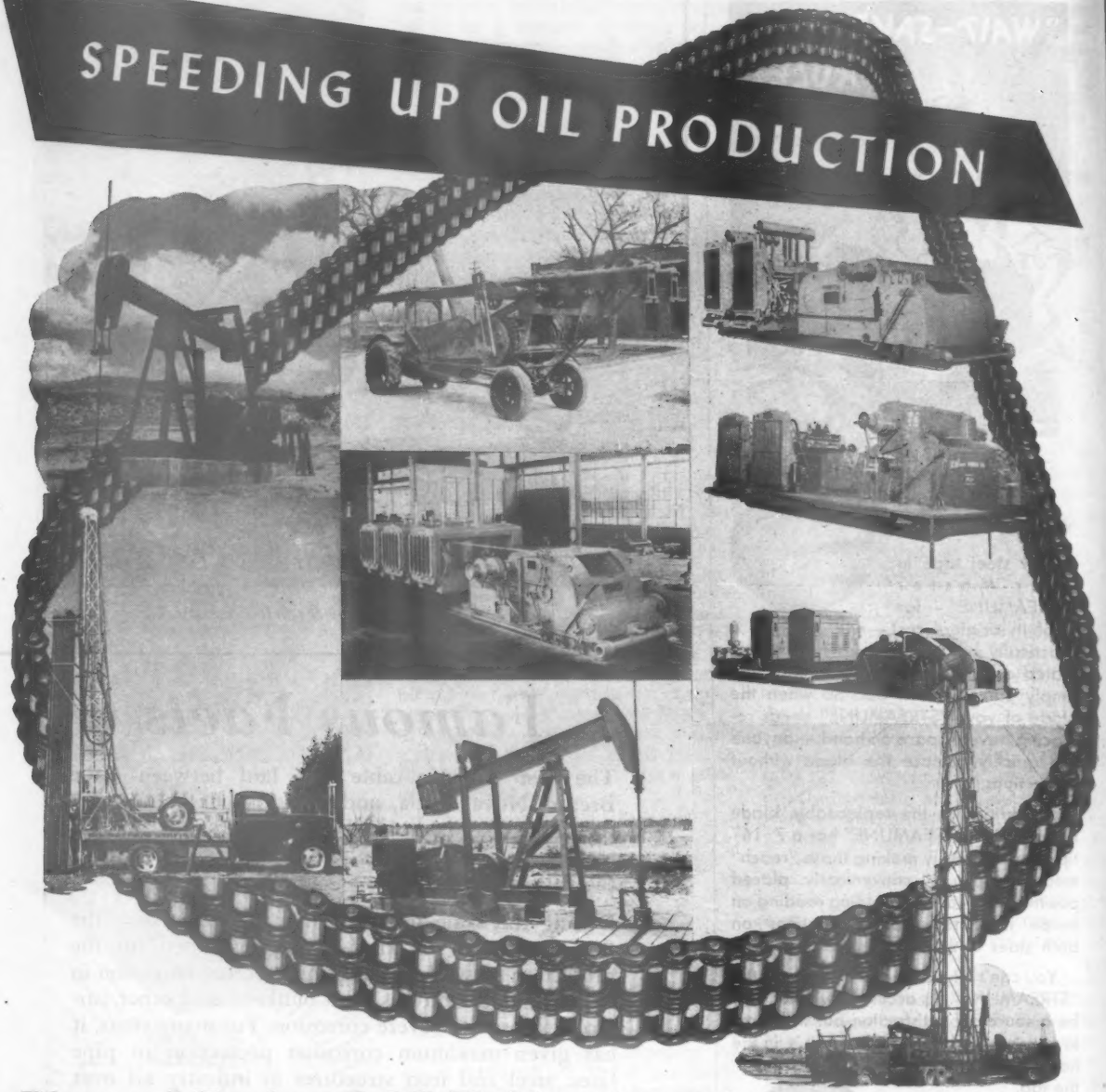
WAILES DOVE-HERMISTON

CORPORATION

WESTFIELD, NEW JERSEY

New York · Philadelphia · Cleveland · Chicago · Houston · Tulsa · Miami
San Francisco · Los Angeles

SPEEDING UP OIL PRODUCTION



Diamond Equipped Oil Field Machinery Better Than Ever

Drilling, pumping and servicing rigs—better today than ever before—have been made available by America's leading builders. Greater speed, greater efficiency, and greater reliability on the job assure the greater oil production required for '45.

Cooperating with the leading manufacturers, DIAMOND engineers have always anticipated new requirements and provided the roller chain drives and transmissions for long-life performance and minimum maintenance. A quarter century of wide usage has proved over and over again that the uniform durability of DIAMOND Roller Chain drives pays dividends and that the inherent elasticity to withstand shock loading protects other elements of the rig.

Experienced production men recognize their value on the equipment they buy and insist on them for any replacements. DIAMOND CHAIN & MFG. CO., 475 Kentucky Ave., Indianapolis 7, Ind. Tulsa Office: 2238 Terwilleger Blvd.

DIAMOND ROLLER CHAINS

Exploration and Drilling

Week's Highlights

THE TXL district of Ector County in West Texas is presenting many interesting problems to the geologists these days, and each new test tends to complicate the pre-Permian geological picture.

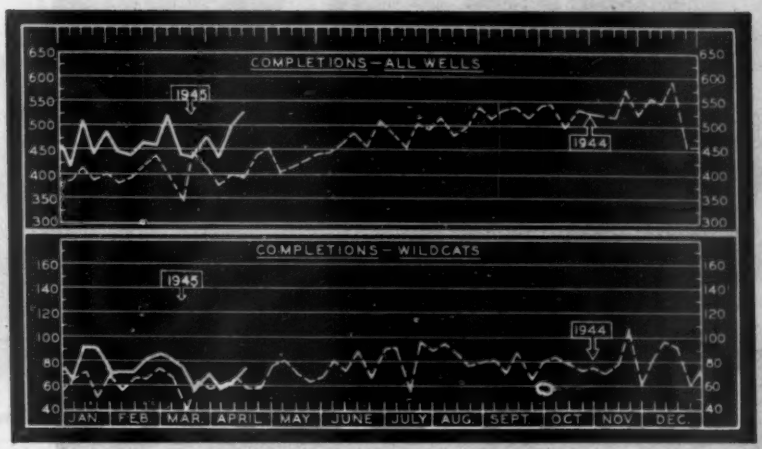
The discovery well, Shell Oil Co., Inc.-Cities Service Oil Co. 1 TXL, in the southeast of Section 7, Block 45, T-1-S, T&P Survey, opened the field with a Devonian lime producer, having backed up to test that formation after finding the Silurian, Ordovician and Ellenburger dry. The second producer, Rowan Drilling Co. 1 TXL, Section 29, Block 45, 3 miles south and ½ mile east, extended the Devonian production by flowing 88 bbl. per hour, although slightly lower structurally than the discovery well. The Rowan well did not test the Ordovician or Ellenburger.

Now the Phillips Petroleum Co. 1-A TXL, in Section 21, Block 45, about 1½ miles southeast of the discovery well, and the highest on the structure to date, after missing the Devonian pay, found good shows in the Silurian, and on a drill-stem test, flowed 60 bbl. of 34-gravity oil in one hour. This pay has been passed up temporarily and Phillips is now drilling in the Ordovician and will continue for a test of the Ellenburger.

From the evidence to date, admittedly somewhat meager, the TXL pool looks like it is on a truncated, steeply dipping structure, where the Devonian may be expected to produce on the flanks part way downdip. Higher on the structure it appears as though the Devonian pay might be eroded but that a halo of Silurian pay might be present.

In some respects the TXL structure, with its eroded top, is similar to that at Oklahoma City. Judging from current speculation about the Keystone structure in Winkler County and general ideas of West Texas pre-Permian depositions, instead of a large eroded structure with a normal fault along one side, as at Oklahoma City, TXL may prove to have an overturn on the east side and possibly a thrust fault.

At Keystone the overturning of the structure is considered definite, but the presence of a thrust fault has not been proven.



Solid line charts current weekly completions, service wells in Eastern area included

COMPLETIONS IN ALL FIELDS . . .

Week ended April 14, 1945

	Oil	Gas	Dry	Total	Footage	Total Comp. to date 1945	1944
New York	13	0	*13	26	33,818	325	272
Pennsylvania	35	6	†37	78	116,111	1,002	541
West Virginia	1	9	3	13	33,210	211	135
Ohio	4	7	10	21	70,185	211	265
Indiana	1	0	2	3	2,911	46	67
Kentucky	2	1	2	5	8,213	98	155
Illinois	9	0	12	21	58,925	443	454
Michigan	4	0	9	13	33,769	204	151
Kansas	15	5	18	38	124,080	429	492
Nebraska, Missouri, Iowa	0	0	0	0	0	12	12
Oklahoma	27	2	12	41	197,301	857	422
Texas:	91	23	64	178	781,658	2,022	1,349
North Central	26	2	24	52	137,998	573	380
West	35	1	17	53	223,446	537	411
Panhandle	1	17	0	18	65,792	169	37
Eastern	4	0	5	9	62,341	87	90
Gulf Coast	19	0	12	31	206,955	470	202
Southwest	6	3	6	15	85,126	186	229
Louisiana:	14	3	3	20	159,194	265	194
Northern	5	2	0	7	34,785	83	77
Southern	9	1	3	13	124,409	182	117
Arkansas	2	0	0	2	7,613	39	61
Mississippi	2	0	4	6	37,314	89	35
Southeastern States	1	0	0	1	2,626	9	8
Montana	2	0	0	2	3,169	75	82
Wyoming	5	0	0	5	19,957	61	41
Colorado-Utah	2	0	0	2	12,099	11	10
New Mexico	7	3	1	11	31,022	146	112
California	35	1	7	43	170,194	649	525
Total United States	272	60	197	529	1,883,369	7,004	5,363
Total previous week	289	54	157	500			
Total April 15, 1944	208	32	114	354			

Service wells included: *13, †33.

For the Deep Jobs...

EMSCO J-1250
POWER DRILLING RIG

Shown above is the Type J-1250 Drawworks, rear view from Driller's side, with guards removed.

THE CONTINENTAL SUPPLY COMPANY
General Offices: DALLAS, TEXAS
EXPORT DIVISION
30 Rockefeller Plaza New York City, N. Y.
Representatives
MEXICO - ARGENTINA - ENGLAND - TRINIDAD - BRAZIL

Designed for the deepest drilling, the Emsco J-1250 Drilling Rig has little increase in weight and no sacrifice in safety factors over units of shallower depth ratings. There is no general use of more massive parts. It incorporates disc-type, air operated friction clutches, has 6 hoisting speeds, 3 rotary speeds, 2 reverse speeds to the drum shaft and 1 to the rotary. Its narrow width facilitates transportation.

The J-1250 is a smooth, easily handled and efficient drilling rig with many new features . . . the result of careful engineering detail plus the high quality of materials and workmanship common to Emsco equipment.

CONTINENTAL

ROCKY MOUNTAIN

Rangely Field Has Good Southeast Extension

DENVER. — An important extension of the proven area of the Rangely field, Rio Blanco County, Colorado, is imminent in Stanolind Oil & Gas Co. 1 Rector, NE SE 34-2n-102w. Location is on the southeast flank 3½ miles from the discovery well and 2¼ miles from Wasatch Oil Refining Co. 1 McLaughlin in Section 32 which flowed 17 bbl. per hour on a drill-stem test through a ¼-in. choke at 6,236 ft., total depth, from the Weber sand. The Stanolind well topped the Weber at 5,624 ft., much higher than expected, and is drilling in at 5,766 ft. after setting the 7-in. at 5,629 ft. In a drill-stem test at 5,616-5,746 ft., open 1 hour, it recovered 1,133 ft. of oil and gas in the 3½-in. pipe and 1,135 ft. of oil and gas-cut mud. The McLaughlin well ran only 8 ft. lower than the discovery on the Weber sand.

Deep test for Barker Creek.—Southern Union Production Co. has made a location for a second deep test on the Barker Creek dome, San Juan County, northwest New Mexico, in its 11 Barker Creek, SE NW 16-32n-14w, a mile north of its recent discovery which made 60,000,000 cu. ft. of gas in the lower Pennsylvania through perforations at 8,400-8,570 ft.

Lease play south of Elk Basin.—Continental Oil Co. 1 Ida Goodstein, NE SE SW 20-57n-99w, South Elk basin, which is showing for a big well in the Tensleep, is still coring in slightly saturated sandy dolomite at 7,146 ft., 186 ft. below the top, and is believed to be near the base. On the strength of the showing in this wildcat, and the belief that it proves a fault closure between it and the Elk Basin pool, a lease play is on for acreage outside the unit. Leasing extends as far south as Powell, a distance of more than 12 miles. The unit contains 7,040 acres.

Little Buffalo Basin outpost.—Stanolind Oil & Gas Co. 6 Unit, NE NE NW 1-47n-100w, Little Buffalo Basin, Park County, Wyoming, ½ mile north of 3 Unit, the nearest producer, which swabbed 20 bbl. an hour from the Tensleep, is drilling at 4,908 ft. in green shale. A drill-stem test at 4,715-60 ft., open 1 hour, recovered 30 ft. of oil and 170 ft. of oil-cut mud in 4½-in. drill pipe.

Test for Arlington district.—Wasatch Oil Refining Co. is rigging up for a Tensleep test in its 1 Dixon, SW NE NE 23-19n-78w, Carbon County, Wyoming, located between the Dutton Creek and Rock River fields. It is near several wildcats which did not go deep enough to reach the objective.

Mush Creek to be developed.—Two locations to explore the Mush Creek area, Weston County, Wyoming, have been made by Western Oil Trust in 1 Emblem, NW SE 24-44n-62w, and Elben Syndicate 1 Government, SE SW NE 24-44-62. A discovery was made early in 1944 in Western Oil Trust No. 1, in NW SE of 24, which flowed 80 bbl. in 24 hours at 3,855 ft. in the Dakota.

Eastern Colorado wildcat.—Dodge Drilling & Development Co. is building derrick for a test in SE SE 11-4s-56w, Middlemist dome, Washington County, eastern Colorado. Location is a mile north of a well drilled in 1929-32 to a depth of 1,552 ft., which did not reach its objective. The structure was geologized by the late C. T. Lupton in 1928 and he estimated the depth to the Dakota at 4,500 ft.

MONTANA SUCCESSFUL WILDCAT

Toole County: Devon extension—Texas Co. 1 Weir, NW SE NE 4-33n-1e, TD 1,647 ft., Sunburst 1,380-1,428 ft., show of oil and water at 1,388-1,421 ft., Ellis-Madison 1,645-46 ft., 400,000 cu. ft. gas, 2,053,000 cu. ft. gas in Ellis at 1,647 ft., spraying 28° gravity oil, flowed 83 bbl. clean oil in 27 hours, 25 lb. back pressure, then 33 bbl. in 16 hours, still testing. ¼-mile extension west of 1 Eckholt, discovery well.

SOUTH LOUISIANA

New Sand Discovered in West Tepetate Field

NEW ORLEANS. — Barnsdall Oil Co. completed 3 Minos Miller in a new sand for the West Tepetate field in Jefferson Davis Parish. The well flowed at the rate of 1,057 bbl. daily from perforations at 8,400-08 ft., through a ¼-in. choke, casing pressure 1,100 lb., gas-oil ratio 1,041 to 1, gravity 35.2° and is now waiting on a dual completion permit. The lower sand flowed a state potential of 661.20 bbl. daily through a ¼-in. choke from perforations at 8,523-42 ft., tubing pressure 1,200 lb., gravity 36°, no water, gas-oil ratio 805 to 1. Total depth of the hole is 8,572 ft.; with 7-in. casing set on bottom.

The Union Sulphur Co., Inc. completed two wells in Jefferson Davis Parish. The company's 1 Adam Trahan Unit 1, 22-10s-4w, at South Roanoke, flowed 280 bbl. daily, no water, through a ¼-in. choke from the perforations at 10,148-58 ft., tubing pressure 500 lb., gravity 43, gas-oil ratio 690 to 1. It's 1 Wm. O. Cook, 35-8s-4w, in the Roanoke field, flowed at the rate of 156 bbl. daily through a 12/64-in. choke from perforations at 8,686-93 ft., no water, tubing pressure 170 lb., casing pressure 100 lb., gravity 40.4°, gas-oil ratio 660 to 1. This latter well was drilled to a total depth of 8,775 ft. and had previously tested through perforations at 8,730-40 ft. where it made 100 per cent salt water on gas lift.

Union Sulphur Co. 1 Kahn, 25-7s-1e, Bayou Mallet area, in Acadia Parish, is making a drill-stem test through new perforations at 9,610-14 ft. This well had previously flowed at the rate of 195 bbl. daily of 33.1° gravity oil from perforations at 9,610-18 ft. but had shown some salt water, so operators squeezed to reperforate for the current test. Total depth is 10,320 ft., with 5-in. liner set to 9,840 ft.

The Atlantic Refining Co. 2-B Lutcher-Moore Lumber Co., 33-10s-6e, Reserve area of St. John Parish, was abandoned at a total depth of 10,962 ft.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Acadia Parish: Egan new sand—Sun Oil Co. 1 B. W. Freeland, 38-9s-1w, TD 10,660 ft., perforated 8 holes 10,102-04 ft., PT 170 bbl. day ⅛-in. choke, gas-oil ratio 726 to 1, tubing pressure 1,300 lb., gravity 38.1°, 0.2 per cent water.

St. Martin Parish: New sand, St. Martinville North Flank—135-10s-6e, TD 11,428 ft., perforations 9,750-65 ft., PT 58 bbl. day 12/64-in. choke, gas-oil ratio 33,659 to 1, tubing pressure 3,750 lb., gravity 48°.

KANSAS

Livengood Pool Gets Second Producing Well

R. S. TOMER PRODUCING CO. 1 Husted, NE SW NE 3-1s-15e, in the Livengood pool of Brown County, is being completed as the second producing well in this new pool. Situated about 5 miles southwest of the Falls City, Nebraska, field, Livengood is the first oil area in the four-state Forest City basin. The 1 Husted found the top of Mississippi lime at 2,209 ft., base of Mississippi at 2,546 ft., and top of the Hunton at 2,553 ft. Casing was run and cemented at 2,558 ft., and when plug is drilled, the well is expected to be as good as the 1 Livengood, which produces 60 to 75 bbl. per day of 26.5° gravity oil. The new well is a north offset to the discovery well. The R. S. Tomer Producing Co. has announced that about one well per month would be drilled until the limits of the new pool are defined.

Barton County.—The southeast Trapp

DAILY AVERAGE PRODUCTION FOR WEEK

	Apr. 14 crude oil	Distillate, allied products	April PAW quota all oils	Apr. 7 crude oil
Alabama	300	.....	300	250
Arkansas	80,550	5,200	85,200	80,500
California	906,700	58,560	977,360	906,750
Colorado	9,300	.....	10,500	9,550
Eastern	64,050	8,400	76,600	64,000
Illinois	187,600	12,000	217,000	199,300
Indiana	11,900	.....	12,500	12,000
Kansas	268,150	4,300	278,300	255,450
Kentucky	23,400	3,200	35,200	16,500
Louisiana	366,050	40,000	400,000	366,050
North Louisiana	71,050	.....	.....	71,050
South Louisiana	295,000	.....	.....	295,000
Michigan	53,400	700	47,700	47,050
Mississippi	52,200	.....	53,000	51,450
Montana	22,650	300	23,300	22,750
Nebraska	950	.....	1,000	1,000
New Mexico	104,500	4,900	109,100	104,550
Oklahoma	378,300	28,000	395,500	374,550
Texas	2,170,550	160,000	2,330,000	2,170,550
East Texas	378,100	.....	.....	378,100
East Central Texas	145,550	.....	.....	145,550
North Central Texas	150,000	.....	.....	150,000
Texas Panhandle	90,000	.....	.....	90,000
West Texas	489,500	.....	.....	489,500
Southwest Texas	352,150	.....	.....	352,150
Texas Gulf Coast	565,250	.....	.....	565,250
Wyoming	101,250	3,600	103,600	99,850
Total United States	4,801,800	329,160	5,156,960	4,782,100
Change from previous week	up 19,700			

Total production January 1-April 14, 1945 ..... 494,326,050 bbl.
Same period last year ..... 461,731,541 bbl.

area in Barton County has a 100-bbl.-per-hour well in the Williams and Wilson 1 Pruss, SW SW NE 20-16-13w. The well is flowing from perforations in the Kansas City at 3,205-10 ft., after acid treatment with 2,000 gal.

Pawnee County.—Inland Oil Co. is moving in material for a new wildcat test, 1 English estate, SW NW SW 1-21-15w, on the northeast edge of Pawnee County. Closest production to this test is the Pritchard pool in southwestern Barton County. The location is based on sub-surface information.

SUCCESSFUL KANSAS WILDCAT

Rush County: New oil pool discovery—Inland Oil 1 Peterson, SE SE SW 35-19-16w, potential of 2,591 bbl. from Arbuckle at 3,725-27 ft., TD 3,765 ft., Heebner 3,300 ft., Kansas City 3,395 ft., Arbuckle 3,656 ft.

KANSAS WILDCAT FAILURES

Barber County: Stanolind and Skelly 1 Chain, SE SE NE 7-31-11w, dry, TD 4,850 ft., Arbuckle 4,801 ft.

Ellis County: Royer Farris et al 1 Jacobs, NE NE SE 26-11-18w, dry, TD 3,760 ft., Arbuckle 3,685 ft.

Marion County: H. A. Amerine 3 Weise, NW NE NE 36-19-5e, dry, TD 1,121 ft., sandy lime 1,090 ft.

Pawnee County: Vickers 1 Hartman, NW NW SW 7-22-15w, dry, TD 4,127 ft., Arbuckle 4,100 ft.

Rice County: Inland Oil 1 Poppelraiter, NW NE 18-18-10w, dry, TD 3,342 ft., Arbuckle 3,312 ft.

Rooks County: Palmer Oil 1 Denie, SE SW SE 9-8-16w, dry, TD 3,513 ft., Arbuckle 3,471 ft.

Rush County: B & R. Drilling et al 1 Brack, SE SE NW 4-17-17w, dry, TD 3,594 ft., granite 3,588 ft.

Russell County: Kingwood Oil 1 Hoover estate, NE NW SW 36-13-14w, dry, TD 3,396 ft., Arbuckle 3,336 ft.

Stafford County: Sohio 1 Rader, NW NE SW 18-21-11w, dry, TD 3,600 ft., Arbuckle 3,561 ft.

"Count on us, son...
BOTTOM WATER SEEPAGE WON'T
SLOW DOWN OUR PRODUCTION!"
You, too, can be confident bottom water shut-downs won't cause costly delays in your production of the oil our war effort so urgently needs. When you strike bottom water, quickly tamp a cartridge of Eagle Lead Wool into the hole. The fine, flexible strands of this metallic wool effectively pack every crack and corner, become a solid, snug-fitting plug, permanent and non-corrosive. Economical Eagle Lead Wool is rapidly installed in Eagle Wire Containers, sized to fit all casings. Safeguard against bottom water sabotage—order through your jobber today!
EAGLE
1843 EP 1943
PICHER
EAGLE LEAD WOOL
Seals off Bottom Water - Keeps 'em Flowing!
The EAGLE-PICHER LEAD COMPANY · Cincinnati, Ohio
These 3 Eagle Bearing Metals meet most requirements . . .
Eagle Dreadnaught — for extreme speed and pressure conditions
Eagle Outlasta — for medium speed and pressure conditions
Eagle Durable — for low speed and pressure conditions

SOUTHWEST TEXAS

Bee Co. Wildcat Is Testing Gas Sand

CORPUS CHRISTI.—Hewitt & Dougherty 1 T. W. Wolfe, wildcat, 10 miles west of Pettus, in the T. B. Barton Survey, total depth 6,526 ft., is testing. Gas sand was logged at 6,496-6,506 ft. and is reported running low.

Taylor Refining Co. 1-B Cueller, Survey 299, in the Agua Prieta field, Duval County, on 24-hour potential test, flowed 54 bbl. of clean oil, through a 7/64-in. choke, tubing pressure 1,275 lb., casing pressure 1,775 lb., gravity 42.8, gas-oil ratio 7,878 to 1, from 71 perforations at 4,952-64 ft. Total depth is 5,010 ft., with 5½-in. casing at 4,978 ft.

Sun Oil Co. 4 C. N. Stroman, Armstrong field in Jim Hogg County, flowed 88.28 bbl. in 24 hours, through a ¼-in. choke, no water, tubing pressure 60 lb., casing pressure 315 lb., gravity 37.4°, gas-oil ratio 423 to 1, from 60 perforations at 3,670-80 ft. Total depth is 3,688 ft., with 5½-in. casing at 3,688 ft.

The Texas Co. 21 H. C. de Tijerina, in J. Poitevent Survey 269, Tijerina field, Jim Wells County, flowed 227.40 bbl. on 24-hour potential test, through a ½-in. choke, water 1/10 of 1 per cent, tubing pressure 1,900 lb., gravity 39.5, gas-oil ratio 1,117 to 1, from 24 perforations at 7,132-38 ft. Total depth is 7,157 ft., with 5½-in. casing at 7,157 ft.

Midstates Oil Corp. 2 Helene W. Lyons, in Survey 225, Cameron field, flowed 134.06 bbl. on 24-hour potential test, through a 10/64-in. choke, tubing pressure 350 lb., casing pressure 850 lb., no water, gravity 46.8°, gas-oil ratio 412 to 1, from 40 perforations at 4,112-16 ft. Total depth is 4,119 ft., with 5½-in. casing set on bottom.

The South Texas Geological Society announced the name "Leona River" has been given the field discovered by The Texas Co. 1 West, in E. A. Wolff Survey 6, 9 miles from south and 2 miles from east lines of Zavala County.

SOUTHWEST TEXAS SUCCESSFUL WILDCATS

Starr County: Boyle field, new sand—R. D. Farish 1 Sugarland Industries, Porcion 92, Share 7-B, Tract "E", ½ mile east of Boyle field, TD 4,194 ft., perforated at 4,031-43 ft., PT 114 bbl. day through 3/16-in. choke, gas-oil ratio 750 to 1, tubing pressure 290 lb., casing pressure 975 lb., gravity 46.4°, no water.

Victoria County: Heyser field, new sand—Magnolia Petroleum Co. 1 O. M. Lander, J. E. Calban Sur., TD 7,444 ft., perforated 24 holes at 7,126-30 ft., PT 124.26 bbl. condensate through ¼-in. choke, gas-oil ratio 23,911 to 1, and 120,000,000 cu. ft. gas open flow, tubing pressure 2,704 lb., ¼-in. chokes. no water.

SOUTHWEST TEXAS WILDCAT FAILURES

Duval County: M. E. Davis 1 Alliance Trust Co., Santos Garcia Sur., Sec. 20, at Realitos, dry, TD 5,450 ft.

San Patricio County: Fitzpatrick Drilling Co. 1 Winnie K. Maricle et al, Taft Farm Lands, Sec. 10, 5 miles north of Gregory, dry, TD 6,504 ft.

Webb County: R. F. Schoolfield 2 Killiam-Bruni, Albercas grant, Brown subd., 8 miles southwest of Bruni, dry, TD 2,717 ft.

TEXAS GULF COAST

Taylor Area in San Jacinto Co. Extended

HOUSTON.—Navarro Oil Co., George Taylor Survey, a 933-ft. southwesterly extension of the recently opened Taylor area of San Jacinto County, 2 miles south of Cold Springs, on production test flowed 64 bbl. of pipe-line oil daily from open hole in the Wilcox at 7,862-65 ft., tubing pressure 1,500 lb., casing pressure 1,950 lb., gas-oil ratio 5,626 to 1. The company is preparing to stake location for 1-A Foster in this area.

Humble Oil & Refining Co. 1 Korenek, south flank sector at Danbury dome, Brazoria County, made a drill-stem test through perforations at 7,950-62 ft., open 1 hour and 8 minutes, using ¼-in. top and bottom chokes and recovered 1,000 ft. water cushion cut with gas, 330 ft. mud cut with gas and slight oil stain, and 600 ft. of muddy salt water. Previous test, through perforations at 7,984-91 ft. also recovered water cushion, gas-cut mud, oil stain, and muddy salt water.

Gulf Oil Corp. 1 Settegast in the Pierce Junction area of Harris County is drilling out cement after 5½-in. casing had been set on bottom, total depth 10,748 ft. In the Fannett field, Jefferson County, Gulf's 2 Hamshire is waiting on cement to set with 5½-in. casing set to 12,171 ft. Total depth is 12,471 ft. in shale.

Pan American Production Co. 1-B August Schindler, extension test at West Orange Hill in Colorado County, ran drill-stem test at 8,980-9,006 ft. and recovered salt water. It is now coring ahead from 9,020 ft.

Stanolind Oil & Gas Co. 2-B R. D. McDonald, in Battle, Berry & Williams Survey, west side of the Old Ocean field, Matagorda County, is completed flowing 141 bbl. per day through ¼-in. choke, tubing pressure 2,900 lb., gas-oil ratio 24,200 to 1, gravity 51°. Completed through perforations at 10,848-58 ft., the total depth is 10,977 ft. with 5½-in. casing set at 10,973 ft.

Sun Oil Co. 3 E. L. McDonald, in Jacob Botts Survey, at North Bay City Field, Matagorda County, was completed for 78 bbl. daily on gas lift, 0.1 per cent water. Completion is through 32 perforations at 7,762-70 ft., and total depth is 8,800 ft., with 5½-in. casing set on bottom.

SUCCESSFUL WILDCATS IN GULF COAST TEXAS

Hardin County: Village Mills, oil discovery—Houston Oil Co. of Texas and American Republics Corp. 2 fee-Hardin County School Land ,6,500 ft. south and slightly west of No. 1 discovery well, TD 9,559 ft., perf. 20 holes 5,797-5,802 ft., PT 297 bbl. day through 3/16-in. choke, gas-oil ratio 522 to 1, tubing pressure 835 lb., casing pressure 900 lb., gravity 37.1°, 0.2 per cent water.

Matagorda County: Oil discovery—Skelly Oil Co., Stanolind Oil & Gas Co., and Tide Water Associated Oil Co. 1 G. P. Hardy & Horn, I&GN Sur. 4 and Henry Goslin Sur. 2, 1 mile east of Bay City, TD 10,844 ft., perf. 10,095-123 ft., PT 48.80 bbl. day through ¼-in. choke, gas-oil ratio 136,290 to 1, 5,288,000 cu. ft. gas, tubing pressure 3,775 lb., gravity 41.5°.

WILDCAT FAILURES IN GULF COAST TEXAS

Matagorda County: Hammill & Hammill 1 The Texas Co.-fee, Markham area, in William Hudson Sur., 1 mile north of Clemville, dry, TD 3,535 ft.

Wharton County: J. B. Ferguson et al 1 Forrest L. Myers, A. Jackson 2 Leagues, Prairie League, Abst. 34, 2 miles west of Hungerford, dry, TD 6,263 ft.

WISCONSIN
HEAVY-DUTY
Air-Cooled
ENGINES
on the job

OPERATING AIR COMPRESSOR

A typical oil field operation for Wisconsin air-cooled engines is this air compressor assignment on a location near Anamas Pass, Texas. This heavy-duty, single cylinder engine can be depended upon to keep on "pumping air" hour after hour, day after day without layups or need for servicing. Complete freedom from cooling attention and troubles is a point that merits a little extra consideration during times like these . . . or *any time*, for that matter. In a power range of 1 to 30 hp. there is a Wisconsin air-cooled engine of the right type and size for a great variety of oil field applications.

MOST POWER PER POUND

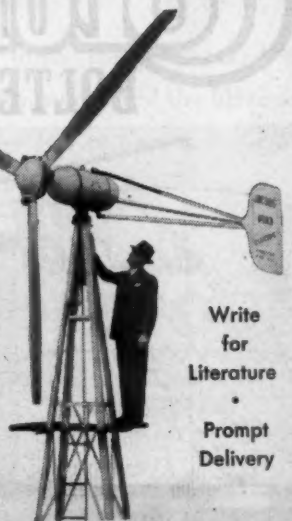
WISCONSIN MOTOR Corporation
MILWAUKEE 14, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

WRITE TO HARLEY SALES CO.
510 Atlas Building, Tulsa, Oklahoma
M & M Building, Houston, Texas
Oil field distributors for Wisconsin Engines and all types of utility units.

PIPE LINE CORROSION

Jacobs Wind Electric Plants

New Improved 1945 Model



2 sizes—1200 and 2000 watts
10 to 40 volts

The new Jacobs Cathodic Wind Electric Plants represent nearly 10 years of manufacturing research in this field. Wherever reasonable wind conditions prevail, these plants will profitably retard corrosion. Practically no maintenance attention is required. They are fully automatic in operation.

Write for Literature
•
Prompt Delivery

THE JACOBS WIND ELECTRIC COMPANY, Inc.
Pipe Line Division
Minneapolis 11, Minn.
America's Oldest Manufacturer of Wind Electric Plants

EASTERN TEXAS

Harrison County Test Gets Big Gas Flow

DALLAS.—D. E. and R. J. Whelan 1 William Peal estate, Bettie Humphrey Survey, a wildcat 1¾ miles northwest of Harleton in northwestern Harrison County, took a 6-minute drill-stem test in the Rodessa through perforations from 6,769-89 ft. on a ¼-in. choke. The well showed for an estimated 50,000,000 to 75,000,000 cu. ft. of gas with distillate. It is drilling ahead. The Texas Co. 1 G. M. Morse, Calderon Survey, a wildcat 1 mile south of Chandler, set 5½-in. casing at total depth of 10,555 ft. Skelly Oil Co. 1 Matthews, McFaddin Survey, a wildcat 3 miles east of Beckville in Panola County, showed its first oil on a 15-minute drill-stem test through perforations from 6,262-85 ft., 6,314-30 ft. and 6,375-88 ft. Total depth is 6,715 ft.

Woodley Petroleum Co. 1 L. J. Murray, I. Lopez Survey, 22 miles southwest of Crockett, Houston County, is dry at 8,042 ft., having had only a slight show of gas from 7,977-84 ft. The Woodbine was topped at 7,969 ft. A new wildcat for Houston County will be drilled by James Papadakis about 10 miles south of Crockett. It is 1 Houston Coal Co., 240 ft. from the northwest line and 800 ft. from the northeast line of a 21.7-acre tract, E. W. Goolsby Survey. West Production Co. and Noranda Oil Co. have staked 1 H. M. Boring, a 9,500-ft. wildcat in Madison County, about 7½ miles southwest of Madisonville. It is the northeast corner of a 100-acre lease in the Amy Boatright Survey.

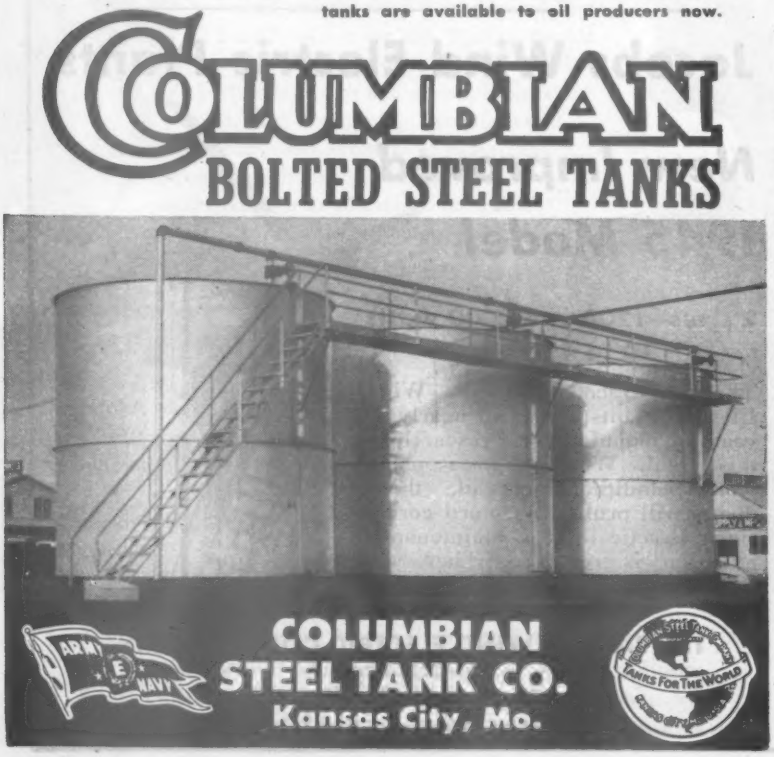
EAST TEXAS WILDCAT FAILURES

Cherokee County: Humble 1 New Birmingham, Levi Jordan Sur. No. 28, 5½ mi. SW Rusk, James 9,390 ft., Pettit 9,820 ft., dry, TD 10,297 ft.

Trinity County: Navarro Oil Co. 1 Edward R. Bolton, Henry Bond Sur. A-75, 3 mi. SE Saron, elev. 317 ft., OTD 6,287 ft., Pecan Gap 8,880 ft., Woodbine 9,970 ft.:, dry, TD 10,500 ft.

Columbian COP-NIC tanks especially for sour crude storage will be available again as conditions permit. Columbian regular bolted steel tanks are available to oil producers now.

COLUMBIAN
BOLTED STEEL TANKS



N. CENTRAL TEXAS

Clay County Tests Get Promising Shows

WICHITA FALLS.—Continental Oil Co. 1 W. M. Hillin, Section 3290, TE&L Survey, wildcat 4 miles southwest of Bellevue in southeastern Clay County, drilled sand showing oil from 5,628-33 ft. It is drilling past 5,848 ft. in shale. Bridwell Oil Co. 1 Vaughn-Holt, wildcat in Block 3, J. H. Belcher subdivision in southwestern Clay, logged oil sand from 3,944-47 ft. It was cored from 3,947-61 ft. and recovered 14 ft. of shale and streaks of sand showing oil. It is coring ahead. Anderson-Prichard Oil Co. 2-A Wood, northeast of the discovery of the Wood Bend conglomerate pool of northwestern Clay, on a drill-stem test from 5,955-70 ft. showed gas in 5 minutes and flowed an ungaged amount of oil. On a 24-minute drill-stem test from 6,041-57 ft., 240 ft. of mud was recovered. It is being drilled deeper.

The Texas Co. 1 Sowder, T. Toby Survey, wildcat in northeastern Cooke County, logged sand and conglomerate with slight oil stain from 3,684-3,700 ft. On a 40-minute drill-stem test from 3,684-3,700 ft., 15 ft. of mud were recovered. It is drilling past 3,710 ft. in shale.

Panhandle Production & Refining Co. 1 Thompson, wildcat 3 miles northeast of Graham, is a failure for northern Young County. Mississippian was topped at 4,681 ft. Total depth is 4,741 ft. in dry lime. Another wildcat failure for northern Young is Shell Oil Co. 1 Huffman, TE&L Survey, 1 mile west of Jean. Total depth is 5,278 ft. Consolidated Oil Co. 1 State Asylum, Block 1, Cherokee County School Lands, 3 miles south of Wichita Falls, topped slightly saturated Caddo at 5,291 ft. Ellenburger was topped at 5,336 ft. A 30-minute drill-stem test from 5,336-70 ft. showed gas in 5 minutes and recovered 60 ft. of oily mud. Total depth is 5,406 ft.

NORTH CENTRAL TEXAS SUCCESSFUL WILDCAT

Wichita County: Extension to old pool—Consolidated Oil Co. 1 Payne-Jones, BBB&C Sur. A-35, elev. 1,041 ft., plugged back to 4,427 ft., pumped 66 bbl. day, perf. 4,194-4,275 ft., KMA 4,123 ft., Caddo 5,072 ft., gravity 43°, TD 5,138 ft.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: P. C. Burns 1 D. W. Fish, Blk. 78, J. W. Harris subd., 6 mi. W and 2 mi. S Archer City, dry, TD 1,402 ft.

Republic Nat. Gas 1 Clemmie Wells, W. A. Haskell Sur. A-755, 2 mi. SE Archer City, dry, TD 1,238 ft.

Clay County: Fain-McGaha et al 1 W. B. Frey, Blk. 103, Parker CSL, 5 mi. S Petrolia, elev. 807 ft., dry in Ellenburger, TD 6,666 ft.

Cooke County: Sam Y. Dorfman 1 J. L. Townley, Wm. Slingland Sur. A-897, 1½ mi. SW Myra, elev. 908 ft., dry, TD 1,616 ft.

NuEnamel Operating Co. 1 C. H. Bush, M. C. Carrico Sur. A-200, 6½ mi. SW Myra, elev. 877 ft., Ellenburger 1,533 ft., dry, TD 1,607 ft.

Throckmorton County: Bridwell Oil 1 Joe Cook, J. D. Hardin Sur. A-209, 5 mi. N and 1 mi. W Fort Griffin, elev. 1,314 ft., dry, TD 1,381 ft.

Wichita County: V. A. Fisher and Frank Woods 1 S. C. Krohn, Sec. 220, Waggoner CSL, 3 mi. N Electra, elev. 1,151 ft., dry, TD 2,482 ft.

C. T. Robertson 1 Ross W. Porter, Sec. 32, Blk. 5, SA&MG Sur., 1 mi. W and 3 mi. S Electra, elev., 1,122 ft., dry, TD 1,415 ft.

WEST CENTRAL TEXAS WILDCAT FAILURES

Callahan County: C. B. Holmes 1 Mrs. I. N. Jackson, Sec. 1, T&NO Sur., 7 mi. S Baird, elev. 1,851 ft., dry, TD 825 ft.

Harold G. Neely 1 Loraine Seale, T&NO Sur. No. 5, 5½ mi. SW Baird, elev. 1,853 ft., dry, TD 1,256 ft.

Coleman County: W. D. Brookover and H. R. Burden 1 S. E. Weaver, J. C. Wofford Sur. No. 502, 15 mi. E Coleman, elev. 1,453 ft., dry in Fry, TD 1,427 ft.

J. L. Collins & Co. 1 Morris Miller, Sec. 16, HT&B, 1 mi. NE Coleman, elev. 1,589 ft., Ranger 2,755 ft., dry, TD 2,895 ft.

Haskell County: Hunter & Hunter 2 Mable Jean Wood, L. Dyches Sur., Sec. 46, 8 mi. S and 4 mi. E Haskell, elev. 1,435 ft., Palo Pinto 3,360 ft., dry, TD 3,613 ft.

Mills County: Emil Ott et al Lula Gatlin, Sec. 112, Caldwell CSL, dry, TD 2,027 ft.

Stephens County: Sinclair Prairie 1 E. S. Curry, Sec. 2264, TE&L Sur., 5 mi. SW Parks Camp, Ellenburger 4,207 ft., dry, TD 4,250 ft.

Woodley Pet. 1 W. H. Tolley, Sec. 458, 1½ mi. SE Gunsight, elev. 1,476 ft., Caddo 3,116 ft., dry, TD 3,595 ft.

MICHIGAN

Another Big Well for Coldwater Pool

SAGINAW.—The Coldwater pool of Isabella County added another big well this week, Cities Service Oil Co. 2 Cummings, in Section 33, rating 1,050 bbl. a day. Three other producers completed in Michigan fields had a combined potential of 260 bbl. a day.

The week's operations resulted in 13 completions, 9 being dry holes, and further dampened wildcatting interest as 7 of the dry holes were in the wildcat category. However, slight oil shows were noted in two of them, which may merit further exploration. One was in Gaines Township, Kent County, the other in Forest Township, Genesee County.

The state Conservation Department, granting 12 drilling permits, listed two locations each in Roscommon, Ottawa and Mecosta counties, one each in Bay, Van Buren, Montcalm, Muskegon, Allegan and Osceola.

MICHIGAN WILDCAT FAILURES

Allegan County, Salem Township: Louis Zellman 1 Shields & Huthy, SW NW SW 36-4n-13w, dry in Traverse, TD 1,722 ft.

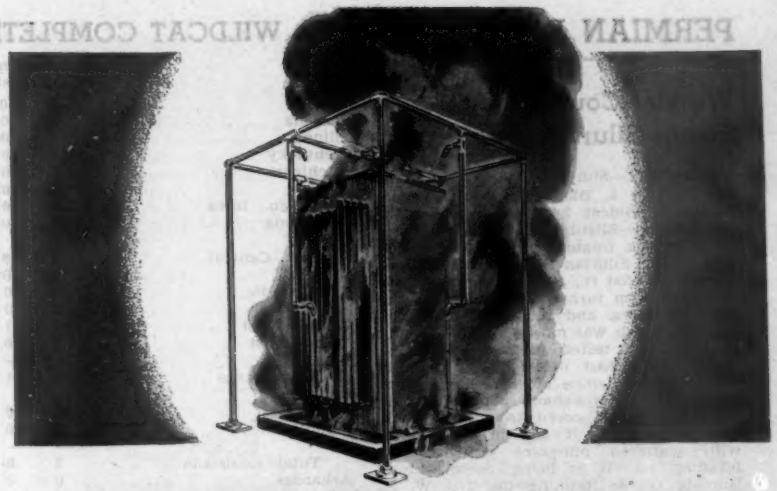
Cass County, North Porter Township: Hugh H. Heinig 1 Dewey Woodrow, NW SW SW 12-9n-8e, dry in Dundee, TD 2,674 ft.

Kent County, Byron Township: Michigan Devonian Petroleum Co. 1 Jacob J. Westrate, NW NW SE 9-5n-12w, dry in Traverse, TD 1,838 ft.

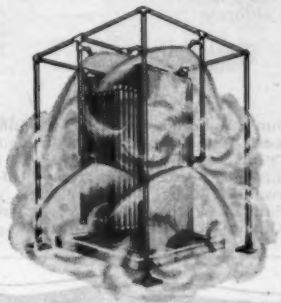
Gaines Township: Oil Producers, Inc., 1 J. E. Aspey, Jr., NE SE NE 8-5n-11w, dry in Traverse, TD 1,949 ft.

Midland County, Larkin Township: Sun Oil Co. 1 Ada F. Patterson, SW SW NW 35-15n-2e, dry in Dundee, TD 3,814 ft.

Saginaw County, Buena Vista Township: Turner Petroleum Co. 1 Katherine Dietrich, NW NW NE 35-12n-5e, dry in Dundee, TD 3,200 ft.



SUPPOSE YOU HAD *only 11 seconds*
to extinguish a roaring transformer fire!



Impossible? Not for "Automatic" FIRE-FOG. In a recent fire test that's just what happened.

Using a standard transformer with FIRE-FOG protection, we ignited transformer oil in and around it and *permitted* the resulting fire to burn several minutes. Then it was up to FIRE-FOG to demonstrate its ability. And it did!

From FIRE-FOG nozzles misty sprays knocked the flames down, cooled the fire area, smothered the blaze and quenched the fire. *Using only a few gallons of water, the entire extinguishing performance took exactly 11 seconds!*

Listed by Underwriters' Laboratories, Inc. and approved by Factory Mutual Laboratories.

"Automatic" manufactures and installs a complete line of fire protection devices and systems for all types of fire hazards. Write for complete information.

"Automatic" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN, OHIO . . . OFFICES IN 31 CITIES

PERMIAN BASIN

Winkler County Test Swabs Silurian Oil

MIDLAND.—Sun Oil Co. 2 Keystone, Section 4, Block 77, Public School Lands, a wildcat 2 miles northwest of the Keystone-Ellenburger pool in Winkler County, was treated with 15,000 gal. of acid in the Silurian through perforations from 8,460-8,594 ft., swabbed into pits for 12 hours, then turned into tanks for the next 12 hours, and recovered 67.56 bbl. of fluid which was mostly oil. It is being swabbed and tested further. Skelly Oil Co. 1 Hogg, east offset to The Texas Co. 1 Hogg, 1½-mile northwest extension to the North Monahans pool in southeastern Winkler, cored from 6,136-52 ft. and recovered 12 ft. and 10 in. of lime with scattered pin-point porosity and bleeding oil. It is being cored ahead. Humble Oil & Refining Co. 1-B W. F. Scarborough, a shallow wildcat 4 miles west of the Hendrick pool, is taking a drill-stem test at 3,502 ft.

Upton County.—Humble 1 J. M. Parrott, a wildcat in eastern Upton, 18 miles northeast of Rankin, was drilling below 10,615 ft. in shale. Humble 1 Gresham, 1 mile west of 1 Parrott, cared from 7,425-65 ft. and recovered sand and shale with slight shows of oil and gas. It is coring below 7,468 ft. in sandy shale.

Crane County.—Gulf Oil Corp. 7-E McKnight, a wildcat in western Crane, 3 miles northwest of the Sand Hills-Ellenburger pool, on a 70-minute drill-stem test from 5,979-6,031 ft. recovered 279 ft. of oil and gas-cut drilling mud. There was a steady blow of air throughout the test. It is being cored below 6,034 ft. in lime. Sun 1 Roberdeau, a wildcat 3 miles northwest of the Crossett pool in southeastern Crane, after acidizing with 500 gal. through perforations from 3,170-3,205 ft. swabbed 10 bbl. of sulfur water per hour. Sinclair Prairie Oil Co. 1 Jennie McKnight, a wildcat in northwestern Crane, topped the Ellenburger at 10,330 ft. It is drilling below 10,410 ft.

Chalmette Petroleum Corp. 1 Lake Shore Corp., a wildcat 1½ miles north of the Fullerton field in Andrews County, was retreated with 5,000 gal. through perforations from 7,529-65 ft. and showed 6,500 ft. of sulfur water which the operator was unable to swab down. It will be squeezed off and perforated higher in the Fullerton pay zone. DeKalb Agricultural Association will drill an 8,000-ft. wildcat in southern Andrews. It is 1-C Lockhart & Brown, 1,980 ft. from the south line and 660 ft. from the west line of Section 12, Block A-41, Public School Lands. The new test is 2½ miles west of 1 Lockhart & Brown, northwest outpost to the Mascho-Fuhrman pool. It is also 1¾ miles northeast of the Sun 1 Martin, recent discovery.

WILDCAT COMPLETIONS AND DISCOVERIES

	Week ended Apr. 14, 1945					Cumulative total, 1945				
	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
Ohio	0	0	0	3	3	0	0	5	19	24
Indiana	1	0	0	1	2	2	0	0	5	7
Illinois	0	0	0	3	3	16	0	0	66	82
Kentucky	0	0	0	1	1	2	0	1	11	14
Michigan	0	0	0	7	7	2	0	0	67	69
Kansas	1	0	0	9	10	11	0	6	91	108
Neb., Mo., Iowa	0	0	0	0	0	0	0	0	9	9
Oklahoma	1	0	1	4	6	29	0	4	77	110
Texas:										
North Central	1	0	0	16	17	32	0	3	133	168
West	2	0	0	8	10	18	0	0	83	101
Panhandle	0	0	0	0	0	0	0	1	3	4
Eastern	0	0	0	2	2	5	2	0	25	32
Gulf Coast	2	1	0	3	6	22	1	10	74	108
Southwest	1	0	0	2	3	7	1	3	48	59
Total Texas	6	1	0	31	38	84	5	17	366	472
Louisiana:										
Northern	0	0	0	0	0	1	0	2	19	22
Southern	2	0	0	0	2	11	0	0	12	23
Total Louisiana	2	0	0	0	2	12	0	2	31	45
Arkansas	0	0	0	0	0	0	0	0	14	14
Mississippi	0	0	0	3	3	3	0	0	32	35
Ala., Ga., Florida	0	0	0	0	0	0	0	0	7	7
Montana	1	0	0	0	1	4	0	0	5	9
Wyoming	0	0	0	0	0	6	0	0	10	16
Colorado-Utah	0	0	0	0	0	0	0	0	3	3
New Mexico	0	0	1	0	1	4	0	2	18	24
California	0	0	0	0	0	0	0	2	52	54
Total United States	12	1	2	62	77	175	5	39	883	1,102
Total previous week	9	0	3	52	64					

WEST TEXAS SUCCESSFUL WILDCATS

Gaines County: Extension to old pool—Texas Co. 2 Robertson, Sec. 21, Blk. A-24, PSL, ¾ mi. W Robertson pool, elev. 3,315 ft., flowed 363 bbl. day through 2-in. tubing, perf. 5,900-68 ft. Top pay 5,905 ft., San Andres 4,410 ft., gravity 29.1°, gas-oil ratio 612 to 1, TD 6,455 ft.

Pecos County: Extension to old pool—Texas Co. 1 C. R. Hart, Sec. 2, Blk. 114, GC&SF Sur., 1 mi. SW Fort Stockton field, flowed 106 bbl. day through fi-in. choke in 2-in. tubing, perf. 2,847-74 ft., top pay 2,847 ft., Yates 2,730 ft., gravity 32°, gas-oil ratio 3,000 to 1, TD 2,879 ft.

WEST TEXAS WILDCAT FAILURES

Cochran County: Helmerich & Payne 1-A Wright, Lab. 14, League 98, Brewster CSL, N Slaughter pool, elev. 3,760 ft., Glorietta 5,500 ft., Clear Fork 6,005 ft., dry, TD 6,513 ft.

Crockett County: Moore Exp. Co. 1 H. M. Halff, Sec. 69, Blk. 1, I&GN Sur., 1½ mi. W Noelke pool, elev. 2,375 ft., dry, TD 1,522 ft.

McCulloch County: Anzac Oil 2 G. R. White, Sec. 80, J. W. Haggerland Sur. A-1757, 2 mi. S Melvin, elev. 1,950 ft., dry, TD 1,429 ft.

Mass-Tex 1 Mrs. J. H. Daniels, John Glassen Sur. No. 1096, 2¼ mi. S Waldrip, dry, TD 165 ft.

Mas-Tex 1 Hays, S. P. Pool Sur. No. 14, ¾ mi. NE Waldrip, elev. 1,427 ft., El-

Twenty pages, profusely illustrated, give detailed explanation of advantages of Rotary Positive principle, including explanatory charts and curves. Features of Roots-Connersville construction and design are fully covered, along with an assortment of installation views showing diversity of applications for which the various types of Gas Pumps are suitable. Capacity and dimension tables cover the standard units, for moderate pressures. A copy of Bulletin 32-33-B-12 is yours for the asking, without obligation.

ROOTS-CONNERSVILLE BLOWER CORP.

One of the Dresser Industries

504 Wells Avenue Connersville, Ind.

Roots CONNERSVILLE SINCE 1854

Rotary Positive GAS BOOSTERS

"Best Bet Yet"

NOW BACK IN FULL PRODUCTION after two years' "layoff" because of war work, these oil-proof, wear-resistant, plastic rings hydraulically pressed on all sizes of tubing collars prevent the collar-to-tubing contact that causes many expensive "wet jobs" in pumping wells.

PATTERSON-BALLAGH TUBING PROTECTORS

LOS ANGELES 1 • HOUSTON 10 • NEW YORK 6

ROPE—"in the course of Human Events"

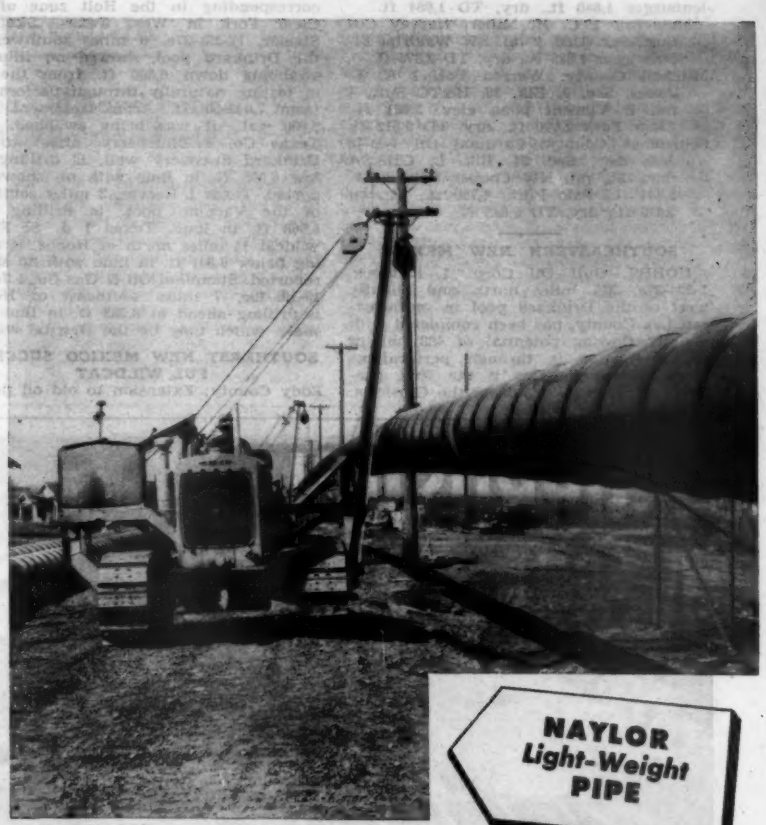
ROPE has had an important part in many historical events. For example, the rope attached to our famous Liberty Bell in Independence Hall. How quickly it transmitted the joyous pulls of an excited Philadelphian one day back in 1776. How faithfully it swung the old bell back and forth . . . back and forth . . . how clearly it transmitted the signal to the world announcing our forefathers' "Declaration of Independence."

Today, rope is continuing to function faithfully in important and vital uses. Because of its great usefulness, we must be careful of what we have, and conserve our present supply of rope to keep it in service until new supplies can be obtained. ⊕ 7904

Our free booklet, "Care and Conservation of Rope," will be mailed promptly, upon request.

NEW BEDFORD CORDAGE CO.

233 Broadway • New York 7, N. Y.
31 St. James Ave. • Boston 16, Massachusetts
325 W. Huron St. • Chicago, Illinois
Mills: New Bedford, Massachusetts



NAYLOR Light-Weight PIPE

GUIDE-POST for OIL MEN

In Search of Better Pipe Performance

Naylor Pipe can serve you best in the following applications:

De-watering pipe	*Surface casing (threaded)*
Gas and oil lines	*Vacuum lines*
Gas and oil gathering lines	*Syphon pipe*
Salt water disposal lines	*Tank gauge pipe*
Sludge lines	*Tank swing pipe*

This light-weight pipe is built to handle jobs normally requiring heavier-wall pipe. Its exclusive Lockseam Spiralweld structure makes it stronger, leaktight and safer than ordinary light-weight pipe. Its accurate diameter and standard weight ends speed installation and cut costs.

Sizes from 4" to 30" in diameter—thickness from 14 to 8 gauge—lengths up to 40 feet. All types of fittings, connections and fabrication.

NAYLOR PIPE COMPANY

General Office
1232 EAST 92ND STREET • CHICAGO 19, ILLINOIS
New York Office
350 Madison Avenue • New York 17, N. Y.

NAYLOR LOCKSEAM SPIRALWELD PIPE

lenburger 1,940 ft., dry, TD 1,964 ft.
Mass-Tex 1 C. H. Miller, Harvey Cos Sur., Sec. 1186, 2 mi. SW Waldrip, Ellenburger 1,835 ft., dry, TD 2,375 ft.
Mitchell County: Warren Pet. 1 C. L. Jones, Sec. 9, Blk. 26, H&TC Sur., 4 mi. E Vincent pool, elev. 2,281 ft., Clear Fork 2,970 ft., dry, TD 5,512 ft.
Schleicher County: Cardinal Oil 1-B-48 Jess Key, Sec. 34, Blk. L, GH&SA Sur., 1¾ mi. NW Cooper field, elev. 2,284 ft., Palo Pinto 4,790 ft., Strawn 5,448 ft., dry, TD 5,843 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Gulf Oil Corp. 1 Paddock, 1-22s-27e, 3¼ miles north and slightly west of the Drinkard pool in southeastern Lea County, has been completed with a daily flowing potential of 483 bbl. of oil. Production is through perforations from 5,200-30 ft. This is the first producer in New Mexico from the Glorietta, corresponding to the Holt zone of the Clear Fork in West Texas. Skelly 2 Steeler, 17-23s-37e, 6 miles southwest of the Drinkard pool, showed no fillup in swabbing down 6,500 ft. from the top in testing naturally through perforations from 7,042-58 ft. After treatment with 2,000 gal., it was being swabbed. The Texas Co. 1 Blineberry, offset to the Drinkard discovery well, is drilling below 6,905 ft. in lime with no shows reported. Texas 1 Reeves, 3 miles southeast of the Vacuum pool, is drilling past 4,868 ft. in lime. Texas 1 J. S. Eaves, wildcat 14 miles north of Hobbs, is drilling below 6,841 ft. in lime with no shows reported. Stanolind Oil & Gas Co. 1 Jones, 19-19s-39e, 7 miles southeast of Hobbs, is drilling ahead at 8,283 ft. in lime and shale, which may be the Detrital zone.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Eddy County: Extension to old oil pool—Nipper & McKinney 1 State, 21-20s-28e, 2 mi. NW Russell pool, elev. 3,234 ft., plugged back to 790 ft., flowed 3,600,000 cu. ft. gas day, perf. 665-750 ft. San Andres. TD 933 ft.

CORROSION,
SCALE,
ALGAE

Courtesy Republic Oil Refining Co. Showing Marley Cooling Tower

READILY CONTROLLED BY
HAERING GLUCOSATES

Let a Haering field engineer survey your corrosion and scale problems and submit recommendations without any obligation on your part. . . . . "We read water."

Write for "Scale and Corrosion Control in Aqueous Systems" and "Water Studies"

D. W. HAERING & CO., Inc.
GENERAL OFFICES
205 West Wacker Drive, Chicago 6, Ill.

OHIO, KENTUCKY

Wellington Pool Has 1-Mile East Extension

COLUMBUS.—Glen Harmon 1 Homer Sooy, Lot 4, Penfield Township, Lorain County, gaged 8,016,000 cu. ft., 6 ft. below top of the first Clinton with a string of tools lost in the hole, and was tubed at that depth, 2,408 ft. The well is a mile east extension to the middle Wellington pool.

E. P. Mellon 1 W. L. Murphy, Lot 2, Washington Township, Tuscarawas County, drilled through the Oriskany sand at 3,470-80 ft., and gaged 879,000 cu. ft. The completion is the first Oriskany offset to the discovery well. The No. 2 well on the same farm found 554,000 cu. ft. in the Berea at 974-79 ft. and was tubed.

H. E. Perkins completed a good well in Lot 10, Butler Township, Knox County. Clinton at 2,721-46 ft. gaged 200,000 cu. ft. with a show of oil, and sand at 2,751-71 ft. gaged 3,000,000 cu. ft. with a rock pressure of 910 lb.

OHIO WILDCAT FAILURES

Columbiana County, Butler Township: Natural Gas W. Va. 1 M. G. Randolph, Sec. 29, Clinton 5,704-43 ft., 30,000 cu. ft., shot, blew down and plugged, TD 5,872 ft.
Medina County, Hinckley Township: Ohio Fuel 1 Stanley Horazdovsky, Lot 82, Clinton 3,456-4,509 ft., dry, TD 3,562 ft.
Tuscarawas County, Dover Township: Reeves Mfg. Co. 1 fee, S. E. Pt., Clinton 4,594-4,684 ft., dry, TD 4,771 ft.

EASTERN KENTUCKY OPERATIONS

ASHLAND.—Completion of one gas well with an open flow exceeding 4,000,000 cu. ft. of gas and an oil well with estimated daily production of 5 bbl. was reported in eastern Kentucky field operations last week.

The Kentucky-West Virginia Gas Co. completed 5553 S. B. Leslie, on Sycamore Creek in Pike County, at a total depth of 3,740 ft., with a daily open flow of 4,287,000 cu. ft. of gas in Big lime.

The Cumberland Petroleum Co. completed 63 L. C. Dailey land in Magoffin County, with a daily estimated production of 5 bbl.

WESTERN KENTUCKY

OWENSBORO.—A 60-bbl. well in Daviess County and two dry holes, one each in Christian and Crittenden counties, were reported from western Kentucky fields during the week.

WESTERN KENTUCKY WILDCAT FAILURE

Crittenden County: Joe Reznik 1 Dave E. Wood, 7-K-20, 1 mi. SW of Piney, dry at 910 ft.

INDIANA

EVANSVILLE.—Four completions, of which three were dry holes and one a 28-bbl. well, comprised Indiana's reported record of the week in the field. Farm Bureau 1 Thomas J. Smith, SE SE NE 17-1s-9w, in a hitherto unproductive spot, developed a 28-bbl. initial production from Waltersburg sand at 1,055-61 ft. It extends the Wheeling pool.

INDIANA SUCCESSFUL WILDCAT

Gibson County: Farm Bureau 1 Thomas J. Smith, SE SE NE 17-1s-9w, Waltersburg sand at 1,055-61 ft., TD.

Pumped 28 bbl. per day through perforations.

INDIANA WILDCAT FAILURE

Sullivan County: The Texas Co. 1 Wabash Valley Land, NE NW SW 28-7n-10w, dry at 2,872 ft. Cypress top 1,115 ft., sand 1,176-1,250 ft., Ste. Genevieve 1,322 ft., Chattanooga 2,531 ft., Devonian lime 2,665 ft.

LA.-ARK.

Stephens-Smart Area Developing Rapidly

MAGNOLIA.—The Stephens-Smart area of Columbia, Nevada and Ouachita counties, Arkansas, had its 418th completion this past week in G. H. Vaughn 4-C Smart, SW SE SE 12-15s-20w, which had an initial production of 200 bbl. With 12 active drilling wells on the list this week, Stephens-Smart is easily the most active area in the state. Since the discovery of the Stephens pool in 1922, and the Smart area in 1941, this field has produced 11,255,971 bbl. of 31 to 33° gravity oil, as of January 1, 1945. The old Stephens pool produces from the Nacatoch and Buckrange sands, and the newer Stephens-Smart pool produces from the Hosston sand of the Lower Cretaceous age.

Hickey & Wallingsford 5 Sumners, SE NE SW 13-18s-14w, in the Hillsboro field of Union County, is being completed for 31 bbl. per day on the pump. Production is from open hole at 2,231-44 ft., and total depth is 2,244 ft.

CANADIAN FIELDS

Conrad Field Credited With Large Pumper

CHATHAM. — In north central Turner Valley Royalite Oil Co. 77, LSD 1, 2-20-3w5, finished at 7,428 ft. with Madison at 6,987 ft., had initial production of 463 bbl. of 40-gravity oil, with 513,000 cu. ft. gas.

Conrad.—Largest producer in Alberta outside Turner Valley, is Mid-Continent 1 East Crest, LSD 2, 8-6-15w4, which had top production of 170 bbl. in 12 hours, but is being pumped at 225 bbl. a day from the Ellis at 3,158 ft. Production is 27.2° gravity. Mid-Continent-East Crest 2, LSD 7, 8-6-15w4, will shoot and acidize the Ellis at 3,178-84 ft., the top 3 ft. being tight. California-Standard 71-4A, LSD 4, 4-6-15w4, is coring from 2,949 ft.

Twin River.—Near the Montana boundary, Trans Alberta 1, LSD 8, 21-1-20w4, has cemented 5½-in. at 3,790 ft. and is deepening to test the top of the Madison around 3,925 ft. Separator will be installed to handle a heavy flow of wet gas at 2,520 ft. testing 450 gal. per 1,000,000 cu. ft.

Steveville.—California-Standard 76-22-A, LSD 12, 22-20-12w4, encountered water in the Devonian lime at 4,164 ft. and is abandoning.

Tempest.—In the Tempest area, southern Alberta, Imperial-Tempest 1, LSD 4, 27-9-19w4, bottomed at 5,112 ft., is retesting Devonian limestone after recementing.

Turner Valley. — In the West Central area, Okalta Oils 16, LSD 15, 35-19-3w5, finished at 7,962 ft., had completed fishing job and resumed testing of the Madison, with initial production around 360 bbl. after first acid.

CALIFORNIA

Good Oil Sand Found East of Paloma Field

LOS ANGELES. — Drilling operations in the Paloma distillate field of Kern County may result in some important developments during the next few weeks as a joint well of Western Gulf and Texas Co. has found what appears to be an excellent oil sand east of the acreage covered in the unit plan and Superior Oil Co. has taken in more zone than have other operators in the north flank of the Paloma structure. The sand found by Gulf and Texas in 67-6 L.A.A.C., Section 6-32s-27e, is undoubtedly the Simmons sand found stratigraphically higher than the Paloma sand. This is the most northeasterly well drilled to date and it looks so much better that field men would not be surprised if Gulf and Texas open up a new pool east of the Paloma field. All indications point in that direction but it may be a little too early to make a prediction, although the Simmons zone production developed to date is separate from the Paloma distillate field. Superior is taking in more zone than other operators in 74-34 Houchin, located in Section 34-31s-26e, and should consequently complete a larger well provided bottom water is not encountered. The thickness of this sand tends to indicate the probability the Paloma field extends farther north than anticipated, in which event the production of black oil might show a substantial increase later on. There is a black oil

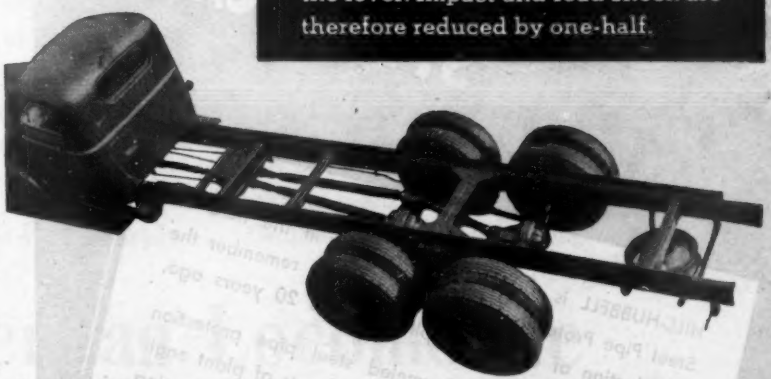
Fabco DUAL DRIVE with Power Selector

Spring suspension is of the "Inverted Semi-elliptic" Type, pivoted to the truck frame at their center point with ends floating free on each axle.

The weight of the springs is "Sprung Weight." They act as a balance lever between the two axles, cutting frame lift in half due to the 2 to 1 ratio of the lever. Impact and road shock are therefore reduced by one-half.

Distributors

ALEX FIEGELSON CO., BEAUMONT, TEXAS
LAMBERT COMPANY, LTD. LOS ANGELES, CALIF.
LELAND EQUIPMENT CO., LONGVIEW, TEXAS
PALLADY WELDING & EQUIP. CO., OKLAHOMA CITY, OKLA.
TRUCK PARTS & EQUIP. CO., WICHITA, KANSAS



Rubber bushed torque arms in a "Parallelogram System" prevent the axles from rolling over . . . always maintain them in a vertical position . . . and transmit driving and braking torque. ☆ The bushings are easily and cheaply replaced; require no lubrication; and are not affected by mud, dust, or oil.

F. A. B. MANUFACTURING CO.
1249 SIXTY-SEVENTH STREET · OAKLAND 8 · CALIFORNIA

belt along the north flank of the Paloma field in contrast with the light gravity distillate or condensate produced from the Paloma sand on top of the structure.

The Tejon district may also come into the limelight shortly as Richfield Oil Corp. has found oil sand in 1 Evans, located several miles northeast of present production. If this well is successfully completed it will result in the discovery of a new field as the well is too far away to have any connection with the present Tejon field.

The development program involving the Elk Hills Naval Petroleum Reserve No. 1 has resulted in the extension of the productive limits of the Buena Vista Hills Naval Reserve No. 2 and has proved up some additional locations on the latter structure within Naval Reserve No. 1. Naval Reserve No. 2, as outlined, did not contain all of the Buena Vista Hills structure and an outpost completion showed this structure to extend over into Naval Reserve No. 1 which encompasses Elk Hills. This extension well is 68-14-B in Section 14-31s-23e, and it was drilled and completed by Shamrock Drilling Co., under supervision of Standard of California, for account of the Navy Department. The hole was carried to 4,163 ft. and has 7-in. casing cemented at 4,100 ft. and 106 ft. of 5½-in. liner including 62 ft. of 60-mesh perforations. A string of 2½-in. tubing was run to 4,050 ft. and the well brought in on the beam pumping 216 bbl. per day.

Standard indicated last year that the Buena Vista Hills structure might extend over into Naval Petroleum Reserve No. 1 by completing well No. 81-23-B, in Section 23-31s-23e, along the northern line of Naval Petroleum Reserve No. 2. Completion of this extension well is of interest in view of the aggressive development program now nearing an end at Elk Hills and the probable early starting of an aggressive exploitation program at Buena Vista Hills where a prolific new zone was found by Standard about a year ago. This drilling has boosted Elk Hills production from 15,000 bbl. daily to 65,000 bbl. per day in about 10 months. Although Elk Hills is at present capable of producing 65,000 bbl. daily, Navy engineers feel that this high production would prove detrimental to the reservoir if taken from the relatively few wells completed to date. Accordingly, field production has been kept below the potential and will probably be maintained below 65,000 bbl. daily until additional wells are completed within the next 60 days.

HILL-HUBBELL is truly a pioneer name in the field of Steel Pipe Protection; pipe line engineers remember the introduction of our mill applied process 20 years ago.

HILL-HUBBELL Biturine Enameled steel pipe protection has set the pace in modern developments of plant engineered cleaning — priming — coating — and — wrapping of steel pipe under controlled conditions to standard specifications.

GENERAL PAINT CORPORATION
HILL, HUBBELL & CO. • Division • Cleveland, Ohio
• EXPORT OFFICE: SAN FRANCISCO, CALIFORNIA, U. S. A. •

OKLAHOMA

New Pay in West Marlow Pool in Stephens County

THE West Edmond field, in Oklahoma, Canadian, Logan and Kingfisher counties, Oklahoma, was 2 years old on April 12. It had produced close to 13,500,000 bbl. of oil. A total of 476 Hunton lime wells were producing on its second birthday, together with 11 Bartlesville sand wells. A 1-mile north extension is being given the field by Anderson-Prichard Oil Corp. 1 Stewart, C NW NW 24-15n-5w, in Kingfisher County, which had more than 40 ft. of saturated Bois D'Arc lime. The crew was drilling ahead below 7,141 ft.

Phillips Petroleum Co. and Carter Oil Co. 1 Dublin, C NE NE 18-15n-4w, about 1 mile north and 1¼ miles east of the Anderson-Prichard well above mentioned, and which was drilled in the hope of extending the field farther north in Kingfisher County, has finally been classified as a dry hole. There was no pay in the Wilcox sand, and no Bois D'Arc formation was found. Total depth was 7,617 ft.

Texas Co. has uncovered a new sand, which looks like a pay, in 1 Sears, C SW NE NE 20-2n-8w, in the West Marlow field in Stephens County. At a total depth of 6,762 ft. 3,000 ft. of oil and 2,500 ft. of oil-cut mud stood in the hole.

Ace Gutowsky 1 A. Young, CNL NW NW 14-24n-11w, in Alfalfa County, an important wildcat, was dry and plugged at 5,938 ft.

Phillips Petroleum Co. and Stanolind Oil & Gas Co. extended the Aylesworth pool in Marshall County with 1 Gibson, SE SE NE 10-6s-6e. The well flowed 64 bbl. of oil while cleaning out from sand at 3,300-93 ft., total depth 3,472 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Garvin County: Extension to East Pauls Valley pool—Texas 1 Tripp, SW SE NW 16-3n-2e, flowed 35 bbl. in 12 hours through 18/64-in. choke from Pennsylvania sand at 2,956-3,042 ft., TD 4,152 ft., first Bromide 3,980 ft., second Bromide 4,064 ft.

Pottawatomie County: New gas field discovery—Texas 1 Vestal, NW NW SE 28-6n-3e, flowed 17,500,000 cu. ft. gas from Layton at 2,854-78 ft., TD 4,463 ft., Hunton 3,870 ft., Viola 4,050 ft., Wilcox 4,440 ft.

OKLAHOMA WILDCAT FAILURES

Cleveland County: Magnolia 1 Hizel, SE SW 23-6n-1w, dry, TD 6,486 ft., Hunton 6,324 ft.

Logan County: Amerada 1 Dodd, SE NW NW 31-18n-4w, dry, TD 6,851 ft., Hunton 6,790 ft.

Okfuskee County: Amerada 1 Barry, NE NE SW 23-10n-10e, dry, TD 3,993 ft., Misener 3,716 ft.

Sunray 1 Wilson, SE SE SW 2-13n-7e, dry, TD 2,587 ft., Prue 2,553 ft.

"ALCO MEETS YOUR BOAT SCHEDULES"

Alco Prefabricated-Pipe Service

Expert Pipe Benders for All Export or Home Needs

To handle a pipe-prefabricating job right—quality, price and delivery—is a tough job, especially for export.

Bending and heat-treating are no easy arts. But for export—there is the added trouble of boxing. It takes a great deal of experience to box prefabricated pipe involving complicated bends. ALCO does it in a way that saves ship space and gets you the lowest possible shipping charges.

Large, completely equipped ALCO shops produce prefabricated piping to close tolerances in all alloys. Its facilities include stress-relieving and annealing furnaces, big bending tables and machines, modern apparatus for X-ray inspection, its own special boxing department.

ALCO's thorough understanding of proper marking ensures quick identification essential to lowest-cost installation.

ALCO knows every custom, rule and regulation affecting prefabricated-pipe shipments for export—meets your boat schedules—smooths the progress of your prefabricated-pipe job *all the way*.

Also available —

ALCO Electric-welded Steel Pipe

In addition to prefabricated piping, ALCO makes electric-welded steel pipe from 20-inch to 120-inch diameters in lengths up to 40 feet.

American Locomotive

ALCO PRODUCTS DIVISION

30 Church Street, New York 8, N. Y. • Dunkirk, N. Y.

ILLINOIS

Concord Pool Supplies Best Completion of the Week

CENTRALIA.—Gulf Refining Co. No. 1 Green, SW SW SW 23-1s-3e, in the Divide West pool in Jefferson County, started off as one of the best new wells of the year when it swabbed 1,124 bbl. in 24 hours from McClosky lime at 2,726-42 ft., total depth 2,866 ft. After it was acidized with 5,000 gal. it produced 80 bbl. per hour on a 3-hour test. It was not yet a completion.

The largest completion of the week in Illinois was Phillips Petroleum Co. 9 L. H. Tully, NW SW NE 21-6s-10e, in the Concord pool in White County, which flowed 843 bbl. per day from McClosky lime at 2,968-73 ft. and 3,017-19 ft., total depth 3,032 ft. It had been acidized.

Only nine oil wells were completed in the state during the week, 8 of these averaging only 56 bbl. per well initially. Nine dry holes were completed. Three of these were wildcats.

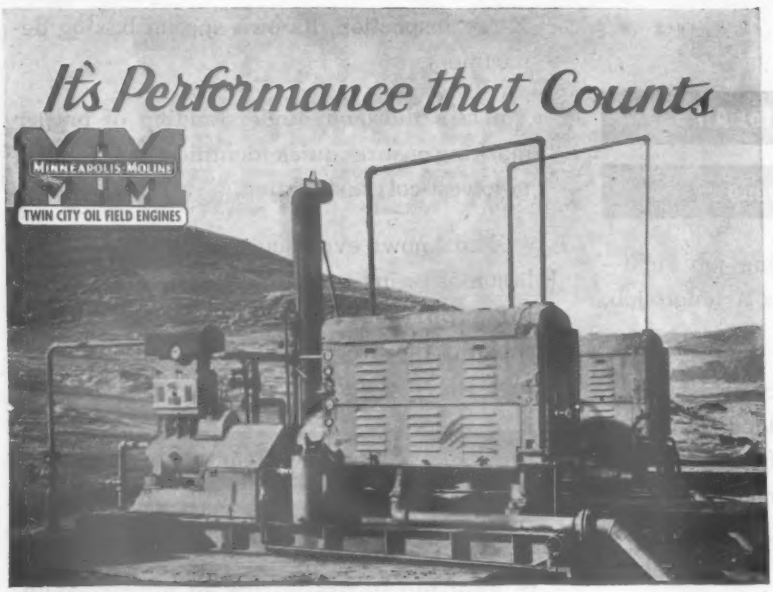
Tide Water Associated Oil Co. 1 W. B. Johnson, SE SE NW 33-6s-5e, Hamilton County, close to the village of Rural Hill, received considerable attention during the week when it cored 11 ft. and 4 in. of saturated Aux Vases sand at 3,241-53 ft. Plug was being drilled preparatory to testing the sand.

ILLINOIS WILDCAT FAILURES

Jefferson County: Ben Nation 1 Schuster, SE SE SW 8-2s-4e, dry at 3,029 ft. Menard 2,160 ft., Barlow 2,597 ft., Benoist 2,753 ft., Aux Vases 2,833 ft., McClosky 2,937 ft., St. Louis 2,978 ft.

Wayne County: Ashland 1 Jerome Molt, NW NW SE 30-1n-8e, dry at 3,225 ft. Upper Glen Dean 2,582 ft., Barlow 2,765 ft., Benoist 3,000 ft., Aux Vases 3,069 ft., McClosky 3,172 ft.

White County: Deep Rock 1 D. Phipps, SW SW SW 29-5s-9e, dry at 3,312 ft. Lower Kincaid 2,060 ft., Cypress 2,868 ft., Benoist 2,950 ft., Aux Vases 3,108 ft., McClosky 3,234 ft., St. Louis 3,280 ft.



The *value received* from an oil field engine *is not measured* so much by its *cost* but rather by the *performance* that it gives—an engine that will operate 24 hours per day, day in and day out giving low cost, efficient performance free of mechanical breakdown is the one that *stands out* in the final analysis. *25,000 hours* of *continuous service* with stops only for oiling and greasing *is not uncommon* with *MM Oil Field Engines*. All the low cost, high performance features are *"built-in"* on *every* MM Oil Field Engine—that is why we say when *you* buy an Oil Field Engine *"It's Performance that Counts"*.

MM Oil Field Engines are built in 8 sizes to fit most every oil field application:

165-4A . . .	3⅝x4, 4 cyl.	CUA . . .	4¼x5, 6 cyl.
206-4A . . .	3⅝x5, 4 cyl.	HUA . . .	4⅝x6, 6 cyl.
KUA	4¼x5, 4 cyl.	MEU . . .	8x9, 4 cyl.
LUA	4⅝x6, 4 cyl.	NEU . . .	8x9, 6 cyl.

For complete information on MM Oil Field Engines, Write:

SHRIMPTON EQUIPMENT COMPANY, *Distributors*

757 Subway Terminal Building, Los Angeles 13, California

545 Mellie Esperson Building, Houston, Texas — **415 Oklahoma Building, Tulsa, Oklahoma**

MINNEAPOLIS-MOLINE POWER IMPLEMENT COMPANY
MINNEAPOLIS 1, MINNESOTA, U. S. A.

APPALACHIAN FIELD

Deep Cross Creek Test Drilling in Tully Lime

PITTSBURGH.—In Cross Creek Township, Washington County, Pennsylvania, the deep wildcat of the Texas Co. is drilling through the Tully lime on the J. E. McCollough farm. It is drilling at 6,031 ft. with the Tully logged at about 6,000 ft., driller's measurement. This test has a surface elevation of 1,259 ft., placing the base of the Genesee at about 4,741 ft. subsea.

In Logan County, West Virginia, Columbian Carbon Co. completed a large gas well, 786 Island Creek Coal Co., in Logan district, in the Big lime. The well gaged 4,213,000 cu. ft. gas, natural, which increased after acid treatment to 6,906,000 cu. ft. with a rock pressure of 575 lb. in 54 hours. This company is drilling three more wells on this tract.

In the same district, South Penn Natural Gas Co. completed 89 Yawkey-Freeman for 3,357,000 cu. ft. of gas from the Big lime and with a rock pressure of 490 lb. in 24 hours.

In Jackson County, Columbian Carbon Co. 778 E. S. Finch, in Ravenswood district, is showing for a gas well in the Oriskany sand with a gage as high as 826,000 cu. ft. The Oriskany sand was topped at 5,025 ft. and gas started showing at 5,050 ft.

In Calhoun County, Hope Natural Gas Co. shot 8,961 Hays-Nicholas, in Lee district, which was reported good for 400,000 cu. ft. gas, natural, from the Injun sand, total depth 2,162 ft. and it increased to final open flow of 1,205,000 cu. ft.

In Boone County, United Carbon Co. completed 1,229 Siler Coal Land Co., Peytona district, with a gage of 1,400,000 cu. ft. gas from the Big lime, topped at 1,334 ft.

MISSISSIPPI

Dual Completion Planned For Baxterville Well

JACKSON.—Gulf Refining Co. 1 Andrews, approximately SE SW 6-1n-16w, in the Baxterville field of Lamar County, will be dually completed after mud is pumped between the surface casing and the oil string, to stop a buildup in pressure. Earlier, the well had tested a heavy oil zone in the Massive sand at 8,756-66 ft. and 8,774-94 ft., and on drillstem test, the well flowed 695 bbl. in 24 hours, with tubing pressure of 1,710 lb., gas-oil ratio 1,100, and bottom-hole flowing pressure of 3,650 lb. Perforations were made at 7,766-82 ft., in the upper Tuscaloosa, where a good show of gas-condensate had been encountered, and a packer suitable for dual completion was installed. Through open port, the well was washed in and tested from the condensate zone, flowing through tubing on ½-in. choke, and yielded 36

bbl. of water white condensate, of 53.7° gravity and 1,750,000 cu. ft. gas per day, with 2,910 lb. flowing pressure, 3,050 lb. casing pressure, and gas-oil ratio of 48,600. The well will be killed because of the pressure buildup, and mud will be pumped in between the oil string and surface casing, before executing the dual completion.

This is the second well in that field to be dually completed. The Superior Oil Co. 1 Batson, NW NE SW 17-1n-16w, was completed March 5, from both a heavy oil zone and a condensate zone.

MISSISSIPPI WILDCAT FAILURES

DeSoto County: Union Producing 1 Withers estate, 3,514 ft. north and 687 ft. east of SW cor. of Sec. 18-2s-9w, dry, TD 4,884 ft., first chert 3,530 ft., Silurian 4,180 ft., second chert 4,273 ft., Bentonite 4,395 ft., Ordovician 4,430 ft.

Jones County: Ginther, Warren & Ginther 1 Mitchell, NE NE SW 23-6n-12w, dry, TD 8,762 ft., base Marine Tuscaloosa 8,298 ft., Massive sand 8,586 ft., Comanche 8,745 ft.

Warren County: Magnolia Petroleum 1 Feld estate, 446 ft. south and 662 ft. east of NW cor. of Sec. 3-16n-4e, dry, TD 8,262 ft., Eutaw 7,370 ft., sand 7,478 ft., Tuscaloosa 8,008 ft.

Patman Wants to Protest Against Proposed Line

WASHINGTON. — Rep. Wright Patman, of Texas, has asked for a hearing before Federal Power Commission in order to present his objections to the proposed construction and operation of a natural-gas pipe line from Texas and Oklahoma fields to Midwest markets.

MARKET QUOTATIONS

Prices as of April 17, 1945

(This service is abbreviated because most refinery products are selling at the Government's price ceilings. Quotations on other products than those shown here furnished on request. Quotations are f.o.b. plant in tank cars and in cents per gallon.)

REFINERY GASOLINE

Octane (A.S.T.M.)	76†	70-74
Mid-Continent*	6.75	5.875
Gulf Coast	6.75	5.625
Northeast Coast		9.075
California		6.50-7.00

*Basic Oklahoma Group 3. †1939 C.F.R. (research method).

NATURAL GASOLINE

Grades:	26-70	18-55
Oklahoma (Group 3)	4.500	5.400
North Texas (f.o.b. plant)	4.125	4.950
North Louisiana (f.o.b. plant)	4.375	5.250
California	4.875	5.500

CRUDE-OIL PRICES

Representative posted schedules per bbl.	
East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Illinois Basin	1.37
Pecos County, Texas	.85
Bradford, Pennsylvania	3.00
Van, Van Zandt County, Texas	1.08

Note: Exclusive of subsidy.

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma Kansas	Gulf Coast Texas	West Tex.*
18-18.9	$0.80	....	....	....
19-19.9	.84	....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	....	1.07	1.30	.94
32-32.9	....	1.09	1.32	.96
33-33.9	....	1.11	1.34	.98
34-34.9	....	1.13	1.36	1.00
35-35.9	....	1.15	1.38	1.02
36-36.9	....	1.17	1.40	1.04
37-37.9	....	1.19	1.42	1.06
38-38.9	....	1.21	1.44	1.08
39-39.9	....	1.23	1.46	1.10
40 and above	....	1.25	1.48	1.12

*Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT

Week ended April 7, 1945

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks Gasoline	Stocks Distillate	Stocks Residual
East Coast	747	13,781	5,093	5,498
Appalachian	158	3,838	494	392
Ill., Ind., Ky.	761	24,086	3,413	1,773
Okla., Kan., Mo.	370	9,604	1,670	1,234
Inland Texas	225	3,029	297	629
Tex. Gulf Coast	1,085	16,701	5,213	5,731
La. Gulf Coast	266	5,116	1,966	1,529
North La., Ark.	80	2,759	756	268
Rocky Mtn.	129	2,613	370	663
California	856	17,185	7,617	24,028
Total 4- 7-45	4,677	*98,712	28,889	41,745
Total 3-31-45	4,742	99,012	26,782	43,327
Total 4- 8-44	4,459	87,247	29,926	52,193

*Military, 45,903; civilian, 52,809.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
April 7, 1945	220,871,000
March 31, 1945	223,782,000
April 8, 1944	234,172,000

*Excludes unrefinable California stocks.

There IS Something New Under The Sun

The technology of drilling mud control has advanced tremendously in the past few years in an effort to overcome new drilling hazards. However, the hazards have increased rapidly as new depth records are attained with the drill bit. Such troublesome problems as heaving shales, chert sections, high pressure zones and porous formations are still causing the companies and contractors much trouble and lost time.

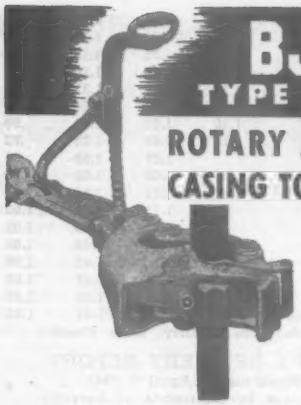
Lubri-Gel Products Company has devoted a great deal of time to the study of these problems, and a large amount of research in overcoming the hazards of deep drilling. While one product may not be infallible in every case, we feel that proper usage of one or more of our products will improve, and in most cases eliminate, the present-day drilling problems.

Our best references are the companies who use our products.

Stocks and Engineering Service available in the field.

LUBRI-GEL PRODUCTS COMPANY

Telephone 112 • LUBRI-SAL LUBRI-WEIGHT LUBRI-PLASTIC LUBRI-GEL • McCracken, Kansas



BJ
TYPE "C"
ROTARY AND
CASING TONGS

Designed for portable drilling rigs, workovers and for handling small sizes of drill pipe on the largest rigs, this tong has proven most popular and successful. All diameters from 2⅜" to 8⅝" are perfectly gripped by using proper size latch lug jaws. Tong can be equipped with either short or standard levers, dependent on derrick conditions. Hinge pin holes are flame hardened to insure long trouble-free life. This tong, like the BJ type "B," is designed to meet unusually tough service conditions.

BYRON JACKSON CO.
Houston • LOS ANGELES • New York

Among the Drilling Contractors

H. M. Williams is the contractor on the Barnsdall Oil Co. 1 Hare, in NE NE NE 13-21-3w, Sumner County, Kansas, 6 miles south of production in the Latta pool. Another Sumner County wildcat which is rigging is the Carter Oil Co. 1 Latimer, in NW NW NE 12-33-2w, which **Helmerich & Payne** will drill.

A. W. Hutchings Drilling Co. has staked location for the 1 Chester Buxton, SW NW NE 19-1n-13e, in Heidelberg field, Jasper County, Mississippi.

Barnes & Shadrick Core Drilling Co., composed of D. B. Barnes and N. C. Shadrick, are drilling a well under contract at Santa Paula for J. Oscar Smith but will soon move to the Mettler Farm where two jobs are waiting. Equipment being used consists of one gas-driven rig capable of going to 1,500 ft., and another outfit, in process of assembly, capable of depths to 2,500 ft.

Don Davis, previously with **Helmerich & Payne, Inc.**, at Wichita, Kans., has resigned and has purchased an interest in **Ferrel & Young**, a drilling firm with headquarters at Great Bend, Kans. He assumed duties with the new firm this week, at Roswell, N. M.

Lupher Drilling Co. is the contractor on the Sohio Petroleum Co. 1 E. L. DeLong, in N½ NE NW 29-16n-6w, Isabella County, Michigan.

E. H. Adair has the drilling contract on the C. L. Seibel and E. H. Adair 1 Mary Siegrist, in NE NE NW 36-25-6e, Butler County, Kansas, which will be drilled to the Arbuckle lime unless oil is found in formations above that depth.

Delta Drilling Co. is the contractor for Cities Service Oil Co. 1 Rubin Aultman, NE NW 22-7n-16w, Covington County, Mississippi.

Henry L. McEvoy is the drilling contractor on the H. E. Walton and W. B. Stewart 1 H. A. Crane, in SE SE SE 1-16n-2e, Midland County, Michigan.

Rino Drilling Co. is the contractor on the Lion Oil & Refining Co. 1 Lemon "C", in SE NE NE 20-30-13w, Barber County, Kansas. Location is about 3 miles from production in the Chitwood pool.

Cook Drilling Co. has the contract for Carter Oil Co. 1 Virgil Jones, NW NE 23-11n-3e, in Madison County, Mississippi.

Grace & Grace Drilling Co. was moving in for the 1 Tucker, 150 ft. from the southwest corner of Section 8-4s-10w, Cotton County, Oklahoma, southwest of Temple.

Wiegand Brothers Drilling Co. 1 Ussery et al, is a wildcat location in the W. G. Hunt Survey, Guadalupe County, Texas, 3 miles northeast of Kingsbury.

R. D. Morgan is the contractor on the J. L. Cates 1 J. A. Steele, Tr., 200 ft. north and east of SW corner of NW SW 6-21n-2e, in Greene County, Alabama.

Members of the American Association of Oil Well Drilling Contractors were told last week by Glenn A. Campbell, chief of the materials section of Petroleum Administration for War and a director of the association, that drill pipe and tool joints will continue to be the bottleneck in drilling oil and gas

PROVED
IN PEACE—IN WAR

'BESTOLIFE Lead Seal Joint Compound has been used successfully in the Oil and Refining industries for the past fifteen years. During that time, it has proved itself superior in protecting threads and in providing tight joints which can be broken easily.

Today, 'BESTOLIFE has enlisted in the Navy, Merchant Marine and Defense Plants for the duration, and we are proud of this assignment to help in the Victory effort.

But there are still ample stocks of 'BESTOLIFE available on any priority rating, at supply house field stores in every drilling district in the United States and Canada. Use 'BESTOLIFE Tool Joint Compounds for best results!

EXPORT: THE NATIONAL SUPPLY CORP., 30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL
1601 EAST NADEAU STREET
LOS ANGELES 1, CALIFORNIA

Electrode Holder Gives
Performance Plus

Saves on Rods
Works Cooler
Keeps Down Maintenance
Small, Light, Streamlined

Distributors in principal cities
Martin Wells
5886 Compton Ave.,
Los Angeles 1, Calif.

YOU SAVE TIME ALL THE TIME WITH Young DRILLING ENGINES

Because of their unit construction and skid base mounting, you can move a YOUNG Drilling Engine with minimum trouble and do it quickly. When you get it on location, those same advantages help speed your set-up. No elaborate foundation is required. From then on your savings in time begin to pile up. No gears to shift—instant reverse with a single movement of the control lever. Brake sets automatically when clutch is disengaged. Ample power for fast pulling-out. On jobs where time is money, the time you save every day with a YOUNG Drilling Engine really counts.

YOUNG ENGINES MAKE YOUR DRILLING DOLLARS GO DEEPER

YOUNG ENGINE CORP.
CANTON, OHIO

A. E. Avers, P. O. Box 606, Tulsa, Oklahoma
Iverson Tool Co., Texas, Artesia, New Mexico
Branchland Pipe & Supply Co., Huntington, W. Va.
Connelly Machy. Co., Billings & Great Falls, Mont.

OTHER YOUNG PRODUCTS
Natural Gas Carburetors • Orifice Gas Well Testers
Under-Road Boring Machines • Electric Light Plants

UNIBOLT
(TRADE MARK REGISTERED U. S. PATENT OFFICE)
THE ONE BOLT COUPLING

NOT BIG BUT STRONG!

Size: 2"; Weight: 12 lbs.; Test Pressure: 6000 lbs; Safety Factor (at 6000 lbs.): 7.3 . . . that's UNIBOLT! (A ring joint flanged union of the same size and test pressure weighs 54 lbs. and has a safety factor of only 6.5.)

THORNHILL-CRAVER COMPANY
HOUSTON

TUBBS
EXTRA SUPERIOR MANILA
CORDAGE COMPANY

Watch for This Trademark in Post-War Days

when you must replace rope now, ask your supplier for TUBBS—always reliable!

TUBBS CORDAGE COMPANY

Distributors
Allied Supply Co., Los Angeles
Bethlehem Supply Co., Tulsa
Clark-Wall, Inc., Los Angeles
Hickey Pipe & Supply Co., Los Angeles

wells until the war situation eases. Manpower and transportation problems were other matters discussed at an all-day meeting at Dallas, at which Howard P. Holmes, president of the association, presided.

Crescent Drilling Co. is the contractor for Carter Oil Co. 1 Dewey D. Swor, approx. SW NE NE 15-4n-5e, Rankin County, Mississippi.

Goll, Graves & Mechling will drill two tests in Arenac County, Michigan, for Basin Oil Co. and Don Rayburn. These are the B-2 Orville Peters in NE NE NE 7-19n-4e, and the B-5 Emanual Klenk, Communitized, in NE SW NW 8-19n-4e.

Hines & Vernon have the contract for the Wayne Refining Co. 1 Willie Mitchell, 330 ft. north and 360 ft. west of SE corner of NW NE 12-8n-3w, in Washington County, Alabama.

Turner Drilling Co. has been awarded drilling contract on the Pure Oil Co. B-1 State Summerfield, in C S½ SE NW 7-20n-5w, Clare County, Michigan.

Crawford & Daniels Drilling Co. are contractors for the Gulf Refining Co. 1 P. C. Morrison, 559 ft. south and east of NW corner of SW NW 30-1n-13e, in the Heidelberg field of Jasper County, Mississippi.

Production Service Co., California drilling contractor, has spudded a semiwildcat at Costa Mesa, Orange County, California, for a joint well to be drilled by Delaney Petroleum Corp. and John MacLeod in Section 17-6s-10w. This will be a relatively shallow hole.

Charles Mills, of Lloydminster, Alta., has completed National Grant 1, LSD 4, 14-49-28w3, in the Saskatchewan end of the Lloydminster field, for George Grant & Associates, of Regina. Outfit has been moved to LSD 13, 2-49-28w4, for a test for Lloyd Clinch & Associates of Vancouver.

Crow Drilling Co. has the contract for Gulf Refining Co. 24 G. S. Stanley, 554 ft. north and 527 ft. east of SW corner of SE 6-9n-8w, in the Eucutta field of Wayne County, Mississippi.

Thumb Drilling Co. is the contractor on the E. Edwin Brehm 1 Clarence Cain, in SW SE SE 34-11n-8e, Tuscola County, Michigan.

Harbar Drilling Co. has staked a new wildcat location for Harvey County, Kansas, at 1 Berger, in SE SW NE 14-23-2w. Location is ¾ mile south of production in the Halstead pool.

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black—steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

FOR CHANGING FORMATIONS

ZUBLIN DIFFERENTIAL BITS

Four different cutting actions directed at bottom and sides of hole. Features safety and simplicity, trouble free drilling.

See Composite Catalog or Bulletin and Prices upon request.

UNIVERSAL ENGINEERING CO.
OFFICE AND FACTORY
2369 EAST 51st ST. • LOS ANGELES 11, CALIFORNIA
BRANCHES: HOUSTON, TEXAS • LAKE CHARLES, LA.
BAKERSFIELD VENTURA AND AVENAL CALIFORNIA

PERSONALS

Heads Production Department of Humble

PROMOTED from chief petroleum engineer for Humble Oil & Refining Co. to general superintendent of the production department, Carl E. Reistle, Jr., has direct executive responsibility for the activities of that department, under the general direction of David Frame, vice president in charge of production. Reistle joined Humble in 1936 as assistant chief petroleum engineer. He was advanced to chief in 1940.

Shortly after his graduation from University of Oklahoma in 1922 with a degree in chemical engineering, Reistle joined the Bureau of Mines staff at Bartlesville, Okla., where he devoted most of his time to oil production problems. He remained with the bureau until 1933, when he became chairman of East Texas Engineering Association, directing engineering work for a group of operators, a post he held for 3 years.

Reistle is vice chairman of National Crude Oil Industry Committee, technical advisor to the District 3 production committee of Petroleum Industry War Council and is active in American Petroleum Institute and American Institute of Mining and Metallurgical Engineers.

George A. McDonald, formerly utility and railroad editor of the New York Sun, has been appointed director of public relations for American Gas Association.

George W. Holland, in federal Government service since 1908, chiefly in oil conservation, has retired, owing to ill health, from his post as special field assistant to Deputy Administrator Ralph K. Davies, Petroleum Administration for War, detailed to California. Before joining PAW Holland was director of the petroleum conservation division, Department of the Interior.

Ens. John F. Dawson, chemist for The Shamrock Oil & Gas Corp. at Dumas, Tex., has returned to the United States from combat duty in the Pacific

E. M. Skeehan, vice president and treasurer of Barnsdall Oil Co., who underwent an operation at a Tulsa hospital last month, has returned to his home. He expects to be back in his office at the Tulsa headquarters of the company about May 1.

J. Lynn Overlees, Louis R. Burnett and **W. R. Luke,** Oklahoma City, have organized Bluff Creek Oil Co.

Walter W. Brown, geologist for Sohio Petroleum Corp., has been transferred from Oklahoma City to Wichita Falls, Tex., where the company has established new divisional headquarters.

Glen C. Lucas, Newkirk, Okla., employed as an accountant by Standard Oil Co. of Venezuela when he was called to active duty as a first lieutenant from the ROTC, was promoted recently from captain to major in the Chinese Combat Command. He is now serving as an assistant operations officer in field headquarters. He is a graduate of University of Oklahoma.

Lloyd Haseltine, Magnolia Petroleum Co., has been elected president of North Texas Geological Society; **Charles Canfield,** Stanolind Oil & Gas Co., vice president; **J. R. Davis,** Superior Oil Co., secretary-treasurer.

J. W. Walker has been advanced from exploitation engineer in the Houston administrative office of Shell Oil Co., Inc., to senior exploitation engineer at Houma, La. **J. M. Bugbee,** senior exploitation engineer, has been transferred from White Castle to Lake Charles, La.

Sgt. J. A. Simms, who was petroleum engineer for Lion Oil Refining Co. at Shuler, Ark., before entering war service, is doing ballistic research work at Aberdeen Proving Ground, Md.

H. J. Stewart, who joined Sunray Oil Corp. in 1944, has been made the company's engineer in the production department of the Gulf Coast division, with headquarters in Victoria, Tex.

Mark E. Stumpp, formerly in the Tulsa office of British American Oil Producing Co., has been made district geologist at Midland, Tex. **H. B. Dickison** is the company's new scout for New Mexico.

B. Maddox, formerly assistant department manager for Shell Oil Co., Inc. at its butadiene plant at Torrance, Calif., has been promoted to department manager, succeeding **F. E. Caddy,** who was advanced to acting plant superintendent of the same installation. **M. G. Folsom,** who was technical assistant at the plant, has been advanced to assistant department manager.

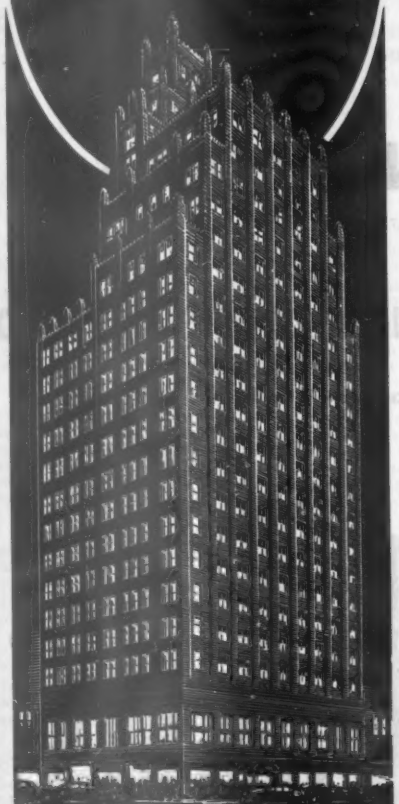
Parker S. Wise, since 1934 assistant manager of the inland waterways division, marine transportation department, Socony-Vacuum Oil Co., Inc., New York, has been advanced to manager of the division. He succeeds **Charles E. Heyl,** who retired after 42 years' service. Wise graduated from Harvard in 1929 with an A.B. degree and joined Standard Oil Co. of New York the same year.

Felix H. Sanders, Jr., who was district foreman for Sun Oil Co. at its Westwego terminal in Louisiana when he entered naval service 3 years ago, was promoted recently to lieutenant commander USNR.

Charles O. Premo has been elected secretary of the San Joaquin Valley Oil Producers Association, succeeding the late Thomas W. McManus.

T. B. Rendel, formerly assistant to the general manager of manufacturing for Shell Oil Co., Inc., has been named technical assistant to the manager of the central aviation department in the head office, New York. Rendel, a graduate of Dartmouth and Clare colleges in England, joined Shell in 1927 as a motor-testing engineer in Wood River, Ill. Twelve years later he was made

Where Your Comfort and Convenience Come First



Owned and Managed by Texans

The BLACKSTONE
FORT WORTH'S HOTEL OF DISTINCTION

JOE T. O'KEEFE, President
E. B. HANNA, Manager

chief research engineer (engines). In 1942 he received a special assignment with the British Aviation Commission, returning to the company early in 1944.

Byron A. Williams, back from 2½ years in the Navy and former landman for Cox & Hamon, Inc., is planning to operate as an independent, with headquarters in Ardmore, Okla.

P. L. Mulkin, Oil City, Pa., director and superintendent of distribution for United Natural Gas Co., has retired after 44 years of continuous service with the company. He joined United as a clerk in the superintendent's office.

Frank W. Abrams, vice president of Standard Oil Co. of New Jersey, has been named chairman of a corporations committee in the nationwide campaign of the United Urban League Service Fund to raise $350,000 for expansion of the organization's work in promoting better use of Negro labor and fuller cooperation between management and labor in the Negro's behalf.

Duncan Neblett was elected vice president and **M. J. McKinney** treasurer of Eastern States Petroleum Co., Inc., at a recent meeting of the directors in Houston. Neblett joined the company in January 1943 as assistant to the president. McKinney was formerly assistant treasurer.

Warren L. Calvert has resigned as geologist for Ohio Fuel Supply Co. and joined the geological staff of Magnolia Petroleum Co. in Oklahoma City.

Walter C. White, formerly industrial relations manager for Sohio Pipe Line Co. and Sohio Petroleum Co. in St. Louis, has been promoted to superintendent of the Michigan-Toledo division of the pipe-line organization, with headquarters in Mount Pleasant, Mich.

CALENDAR

May

American Institute of Chemists, Medal meeting, Columbus, Ohio, May 11.

June

Interstate Oil Compact Commission, quarterly meeting, Oklahoma City, June 15-16.

Canadian Gas Association, annual convention, Manoir Richelieu Hotel, Murray Bay, Quebec, June 19-22.

October

Texas Mid-Continent Oil and Gas Association, Rice Hotel, Houston, October 4-6.

I.P.A.A., annual membership meeting, convention city to be selected later, October 15, 16 and 17.

ORBIT VALVES

DRILLING VALVES ARE QUICK OPENING

ONLY 2½ to 5 TURNS ARE REQUIRED TO FULLY OPEN OR CLOSE THE ORBIT DRILLING VALVE. THE SEATS ARE PROTECTED AGAINST DAMAGE FROM DRILLING TOOLS AND WIRE LINES

Orbit Flanged End Drilling Valve

ORBIT DRILLING VALVES ARE AVAILABLE IN BOTH FULL OPENING AND NOMINAL OPENING SIZES. WITH FLANGED OR SCREWED ENDS.

See 1944 Composite Catalog

SERVICE REPRESENTATIVES
R. G. "Bob" Cole, Houston, Texas
Phone Fairfax 0057
Warehouse 1121 Rothwell, Sect. 15, Houston
Earl F. Warren, Phone 919-W, Alice, Texas
Rex E. Galloup, Phone 6436, Lubbock, Texas

ORBIT VALVE COMPANY
TULSA, OKLAHOMA

IMPORTANT *Plus Values*

Compact, Simple Design • Chemical Mixer • Mud Driven . . . no motors or engines necessary • By pass cuts flow direct into pit when desired • Perfected, efficient sample catcher • Approximately 36 sq. ft. screening area.

Simplicity of design, fewer moving parts, and many improved operating features are combined in the SIW Mud Screen to give you a more efficient machine. A secial bypass, controlled by a quick operating valve, permits hulls, jell flakes, etc., to be instantly cut past the screen and directly into the pit. The perfected sample catcher gives you accurate, authentic samples as frequently as desired. Mud driven, it requires no motors or engines for operation. The revolving screen is so perfectly balanced and rotates so easily that the flow from a one-inch pipe will operate it, yet it has sufficient capacity to handle flow from an eight-inch pipe. It has only two bearings, which are located away from the mud, assuring long life.

Get all the facts about the outstanding advantages of the SIW MUD SCREEN. *Write for latest bulletin,* or talk to your supply store.

SUNSHINE IRON WORKS

P. O. BOX 4106 — *MANUFACTURERS OF OIL FIELD SPECIALTIES* — ODESSA, TEXAS — PHONE 266

GEOLOGRAPH mechanical well logging service!

• ***Proven method of securing accurate drilling time data!***

Reasonable rental rates for Geolograph Service make it available to all operators. Write now for further details.

• The Geolograph is a mechanical recorder of drilling time and coring time in minutes per foot. *Foot by foot,* the rate of drilling is measured by the Geolograph and graphically recorded along with such drilling operations as round trips, connections, and shut-down time.

• The Geolograph makes this information available at the time it is of *the most value* in determining the future operation of the well!

"TIME WILL TELL"

THE GEOLOGRAPH CO.

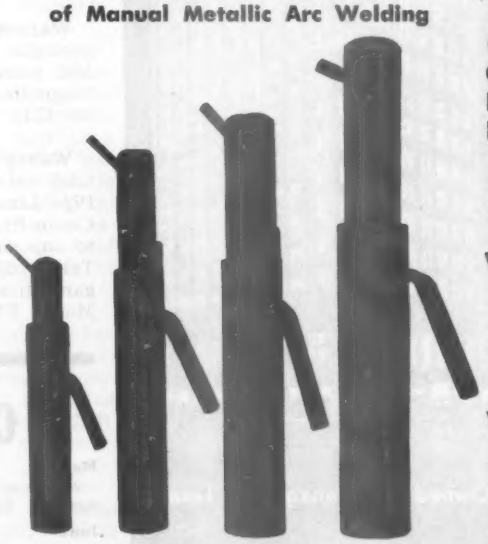
25 North Western — Oklahoma City 4, Oklahoma

"HOL-GRIP" HOLDERS by TWECO

Cover the Range

of Manual Metallic Arc Welding

CAPACITIES 150 to 500 AMPS.



CONNECT WITH TWECO • •

Request the 1945 TWECOLOG *from your supplier or write the factory.*

TWECO PRODUCTS COMPANY

English at Ida — Wichita, Kansas, U. S. A.

Distributed in Canada by G. D. Peters & Co. of Can., Ltd.
1021 Birks Building — Montreal 2, Canada

Distributors all over the United States

S. L. MYERS

H. D. POWELL

J. W. GREENE

VAL LINK

W. EVANS

F. C. MERRITT

Equipment Men in News

S. L. ("Sid") Myers, formerly vice president in charge of export sales for LaPlant-Choate Manufacturing Co., Inc., of Cedar Rapids, Iowa, has been appointed vice president and general sales manager, succeeding **H. H. Buchanan** who resigned. Myers has served LaPlant-Choate in various capacities for over 22 years.

Harold D. Powell has been named division tubular manager for the Mid-Continent Supply Co. and will headquarter at the company's general offices, Mid-Continent Building, Fort Worth, Tex.

Joe W. Greene has been appointed general sales manager of The Ohio Injector Co. of Wadsworth, Ohio, manufacturers of OIC bronze, iron and steel valves, according to announcement by **P. M. Arnall,** executive vice president.

After 8 years as sales engineer at the Shreveport, La., office of Westcott and Greis, division of American Meter Co., **Val Link** is now serving in the same capacity at that company's Dallas branch.

Official changes in names of two divisions of Westinghouse Electric and Manufacturing Co., to better describe their expanding functions now and postwar, have been announced by **Walter Evans,** Westinghouse vice president in charge of all company radio, radar and electronics activities. Involved in the changes are the former radio division, which now becomes the industrial electronics division, and the former radio receiver division, which becomes the home radio division.

Floyd C. Merritt has been elected a vice president of Byron Jackson Co. Merritt joined J. E. (Brick) Elliott in 1922 in the formation of the Elliott Core Drilling Co., serving as vice president and general manager until its acquisition by Byron Jackson Co. in 1939. Transferring to the latter company he served as works manager of the oil tool division and in other important executive capacities until his recent promotion.

Carl F. Oechsle has been appointed vice president in charge of sales of Ransome Machinery Co., Dunellen, N. J., a subsidiary of Worthington Pump and Machinery Corp. The sale of Ransome's line of contractors' mixers and pavers will now be handled through Worthington's construction equipment department, of which Oechsle is manager.

W. R. Wood, vice president in charge of the Gas Processes Division of The Girdler Corp., has announced the appointment of **J. D. Gordon** as eastern representative, with offices at 150 Broadway, New York. He became associated with Girdler's Gas Processes Division in 1939.

L. E. Osmer has been appointed sales manager of The Girdler Corp.'s Gas Processes Division, it is announced by **W. R. Wood,** vice president. From 1930 until 1943, when he joined Girdler, he was Semet Solvay Engineering Corp.'s district representative for the Midwest, with headquarters in Chicago.

A. Leschen & Sons Rope Co., St. Louis, Mo., has announced the appointment of **Douglas W. Vernon** as general manager of sales. Vernon has been connected with the industry for the past 20 years.

Larkin Packer Co., Inc., completed its 40th year as a manufacturer of specialized oil industry equipment early in April. On April 5, 1905, **John J. Larkin** founded the company with a little shop in Bartlesville, I. T., from which point a comparatively small area in the upper Mid-Continent was served. A native of Butler, Pa., where his father, W. H. Larkin, Sr., established Larkin & Co. in 1873, John J. Larkin spent his entire life serving the oil industry. Several of his developments in equipment have represented major steps in the progress of safe drilling and production practices. He died in October 1944, and was succeeded as president of the company by his son, **W. H. Larkin.** A second son, **J. J. Larkin, Jr.,** is vice president in charge of the company's engineering and plant production. **Mrs. L. G. Lancy** has been renamed secretary and treasurer.

General American Transportation Corp. has announced the following changes of officers: **Lester N. Selig,** formerly president, was elected to the newly created position of vice chairman, with Max Epstein continuing as chairman of the board. **Sam Laud,** a director and previously executive assistant to the president, was elected president. **W. S. Hefferan, Jr.,** a director and previously secretary, was elected vice president. **Arthur W. Lissauer,** general manager of the process equipment division, was elected vice president. **Maurice J. Feldman** was elected secretary, and **Frank E. Selz** was appointed an assistant to the president.

Mixing Equipment Co., Inc., of Rochester, N. Y., announces the appointment of **George R. Mellema** as representative. His offices are located at 1024 Plymouth Building, Minneapolis, Minn. His territory will include Minnesota, North Dakota, South Dakota, and the extreme western section of Wisconsin.

John J. Yezbak has been appointed manager of public relations as well as the news bureau of The Timken Roller Bearing Co., Canton, Ohio.

The C. J. Tagliabue Manufacturing Co. has sold its assets, including good will, name and patents, to the Portable Products Corp. of Pittsburgh, Pa.

Security Engineering Co., Inc., Whittier, Calif., has announced the appointment of Refinery Equipment, Inc., Tulsa, Okla., as exclusive distributor of Security valves and fittings for the district.

Cardwell Manufacturing Co., Inc., Wichita, Kans., has mailed a request to holders of the company's ring-binder catalog to return them to the company at Wichita to be brought up to date. This catalog has been in use for approximately 4 years, with new insertions furnished from time to time as new products were announced.

The following firms have been awarded the Army-Navy "E": Surface Combustion, Toledo, Ohio; Marmon-Herrington Co., Inc., Indianapolis, Ind., and Walter Kidde & Co., Inc., Belleville, N. J.

C. F. OECHSLE

J. D. GORDON

L. E. OSMER

D. W. VERNON

L. N. SELIG

SAM LAUD

Classified Advertising

HELP WANTED

ENGINEERS WANTED: Graduate Ch.E., M.E., or E.E., 20 to 29 years of age, having refinery or laboratory experience. Essential industry with post-war continuance. State education, experience, salary expected, and date of availability. P. O. Box 2546, Houston 1, Texas.

WANTED by consulting organization: Petroleum engineers with Hayward mud logging experience or its equivalent. Immediate openings in Venezuela, excellent opportunity for advancement to managerial positions throughout the world. Box A-290 The Oil and Gas Journal, Tulsa, Okla.

WANTED: Laboratory Tester for Mid-Continent refinery, capable of making routine tests, T. E. Lead blending and octane rating tests. State experience, education, age, and salary expected, War Manpower Commission compliance. Forty-eight-hour work week. Address reply to Box A-504, The Oil and Gas Journal, Tulsa, Oklahoma.

DRAFTSMEN

For Process Piping on Oil Refineries

Applications solicited from men not now employed in essential work or those completing essential work who have Statements of Availability

ARTHUR G. McKEE & CO.
2300 Chester Avenue
Cleveland, Ohio

FOUR men experienced in use and maintenance of Flow-meters, Temperature Control or Potentiometers. War essential industry. Employment under rules of WMC. Carries highest priority. Central southeast location. Box A-414, The Oil and Gas Journal, Tulsa, Okla.

EASTMAN Oil Well Survey Company has position open for field Sales and Service man in Louisiana Gulf Coast area. Applicant must have good knowledge of and be well acquainted in oil and drilling industry. Attractive salary. Expenses and car furnished. Address written applincation to Box 890, Lafayette, Louisiana.

WANTED: Major oil company engaged in expanding production program requires young men experienced in material and purchasing departments. Give full details including age, experience, education, availability, and draft status. All applications confidential. Box A-514, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLERS: Steady work, good wages, water wells year round, Bucyrus machines; essential to war effort. Write Libby & Freeman, P.O. Box 2201, Orlando, Florida.

WANTED: Graduate Petroleum Engineer, no sales experience required, to handle sales and service nationally known oil field items in Oklahoma, Texas Panhandle, and Arkansas areas, prefer young man interested in solid future. In answering give full particulars and expected remuneration. Replies will be held confidential. Box 1185, Houston, Texas. G.N.L.

Ashland Oil & Refining Company,
Ashland, Kentucky

WANTS
DESIGNING DRAFTSMAN

With experience in oil refinery and power plant piping, pressure vessels and heat exchangers. Independent company with completely integrated operations and a large output of 100 octane gasoline. Due to postwar program this position offers excellent opportunities for the future.

Address all correspondence to Employment Department. Applicants must comply with War Manpower Commission Regulations.

HELP WANTED

DRILLERS
Steady work, good wages, water wells year round, Bucyrus machines, essential to war effort, draft exempt. Apply — Gray Well Drilling Co., Inc., Box 181, Phone 1051, Delafield, Wisconsin.

ENGINEER for field consultation and sales work, by manufacturer of refinery and power plant equipment. Age 25 to 35. Excellent future prospects. Box A-501, The Oil and Gas Journal, Tulsa, Oklahoma.

SALESMAN: To contact oil trade in New York City for large Valve Manufacturer. Engineering experience preferred. Permanent position with good opportunities. State education, experience, salary expected and availability. Box A-499, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Chemist or engineer experienced in development of lubricating greases. Postwar possibilities with major eastern manufacturer for qualified man. Include inexpensive photo with application. Box A-507, The Oil and Gas Journal, Tulsa, Oklahoma.

MEN FOR FOREIGN EMPLOYMENT
in Saudi Arabia

Refinery operators; petroleum, electrical and mechanical engineers; radio operators and technicians; air-conditioning and refrigeration mechanics; stabilizer operators; welders (pressure-vessel-pipeline); stenographers; typists.

Employment offers opportunities for post-war security and advancement. Liberal benefit plans; vacations in United States; free hospital and medical care.

If genuinely interested in foreign career, send full information on experience, transcript of college record (professional applicants only), references, draft and availability status to our Employee Relations Department.

ARABIAN AMERICAN OIL COMPANY
200 Bush Street
San Francisco 4, California

SITUATIONS WANTED

EXPERIENCED gas distillate production and plant man with long administrative and supervisory background desires change. Box A-485, The Oil and Gas Journal, Tulsa, Oklahoma.

PRODUCTION Superintendent, 40 years old, with more than 20 years practical experience in all phases of the oil producing business, desires connection with small progressive company. Box A-494, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES Engineer having outstanding contacts with major engineering concerns in the East desires acting as manufacturers representative of well established products. Box A-500, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL ENGINEER, interested in Petroleum refinery production or technical departments: 6 years' experience in design, operation and supervision of pilot plants for thermal and catalytic cracking, alkylation, isomerization, hydrogenation, and distillation. Box A-506, The Oil and Gas Journal, Tulsa, Oklahoma.

PETROLEUM Engineer-Geologist. Associated with major company for 15 years, desires connection with independent concern. Box A-508, The Oil and Gas Journal, Tulsa, Oklahoma.

COMMERCIAL Pilot with 0-975 hp. rating, three years secretarial experience, would like employment as a combination Pilot-Secretary. Address: 639 Slattery Blv'd., Shreveport, La.

ACCOUNTANT: 15 years experience in production and pipe-line accounting; 3 years experience with construction firm; desires position. Available in 30 days. Box A-509, The Oil and Gas Journal, Tulsa, Oklahoma.

COMPETENT, Warehouseman, Field Clerk, Material and Inventory Man, 41 Years Old With General Office Experience Desires Connection. Box A-510, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENTS, Trade-Marks, Booklet, "General Information Concerning Inventions and Patents" and "Free Schedule" sent without obligation. Established 1915. Lancaster, Allwine & Rommel, Suite 418, Bowen Bldg., Washington 5, D. C.

EQUIPMENT WANTED

WANTED TO BUY: 1 Wilson pulling unit mounted on truck, unit to be capable of pulling tubing in 6 to 7 thousand feet wells. Quote price and full description and location of machinery. LOUISIANA IRON & SUPPLY COMPANY, Shreveport, Louisiana.

WANTED: 24L Bucyrus-Erie Spudder or a 22W Bucyrus-Erie Spudder with gas heads. With or without tools. Donald J. Roe, c/o Yendes Motel, State Route 48, R.R. 1, Vandalia, Ohio.

WANTED
2½ INCH PIPE
Also other sizes of pipe and tubes.
Write, wire or phone
SONKEN-GALAMBA CORP.
Kansas City 18, Kansas.

EQUIPMENT FOR SALE

FOR SALE: 5 x 10 High Pressure mud pump powered by Model K428 Buda engine. R. L. Melton, Seminole, Okla.

FOR SALE: 1—13⅜" OD Hydrill Type R Number 4 Blowout Preventer in good condition $1750, and 2900 feet 6⅝" 25.2# Grade D Drill Pipe with A.P.I. Regulator Tool Joints Bucked and Welded at $1.50 per foot. Reply Box 2375, Odessa, Texas.

FOR RENT: New explorer's type K & R alidade with new tripod. $25.00 per month. Box A-513, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: 150 H.P. LeRoi Natural Gas or Gasoline engine, equipped for natural gas. 6¾" bore, 7" stroke. A-1 shape, THERMO FIRE BRICK COMPANY, Sulphur Springs, Texas.

RELAYING RAILS
12#—exceptionally good quality

RAILROAD TIE PLATES
for all size rails. All in good condition. For complete details, contact
SONKEN-GALAMBA CORP.
Kansas City 18, Kans.

FOR SALE
COMPLETE ROTARY POWER RIG

1—34-26 National Ideal Draw Works
1—122′ x 24′ Base API Steel Derrick with Substructure
4,800′—4½" OD 16.60# Gr.D Drill Pipe w/ 4½" Hughes Extra Hole Flash Weld Tool Joints (this pipe has made one well)
2—LRO Waukesha Engines (completely overhauled) w/ starting engine
1—42" National Reverse Clutch
1—7¼" x 16" Universal Power Pump W/ V Belts (New)
1—6" National Type AA Swivel
1—66" National Traveling Block
1—9" National Hook
1—23" Brand New Ideco Streamlined Rotary Table
1—4½" Baash Ross Kelly
1—2½" x 50′ Rotary Hose
1—9′ x 12′ New Steel Dog House
1—New Steel Tool Box
1—7½ KW Light Plant w/ FCU Waukesha Engine
1—6¼" x 30′ Drill Collar
1—1⅛" x 1,350′ American Drilling Line
1—Martin Decker Weight Indicator
1—400 Ton Reagan Crown Block
1—Casing Wagon
1 Set—Varco Drive Bushings
1 Set—New 4½" B. J. Rotary Tongs
1 Set—B. J. Elevators
1 Set—72" B. J. Elevator Links
1 Set—Mission Slips
1—Wisconsin 10M Centrifugal Pump w/ 50′ 2" Hose
1—Water Softener
1—250 Bbl. Steel Water Tank
1 Set—Steel Pipe Racks
1 Set—Weco Canvas Windbreakers

If Interested in Rig in Excellent Condition Capable of Drilling 8,000′, Write, Wire, or Phone

FRENCH TOOL & SUPPLY CO.
Odessa, Texas